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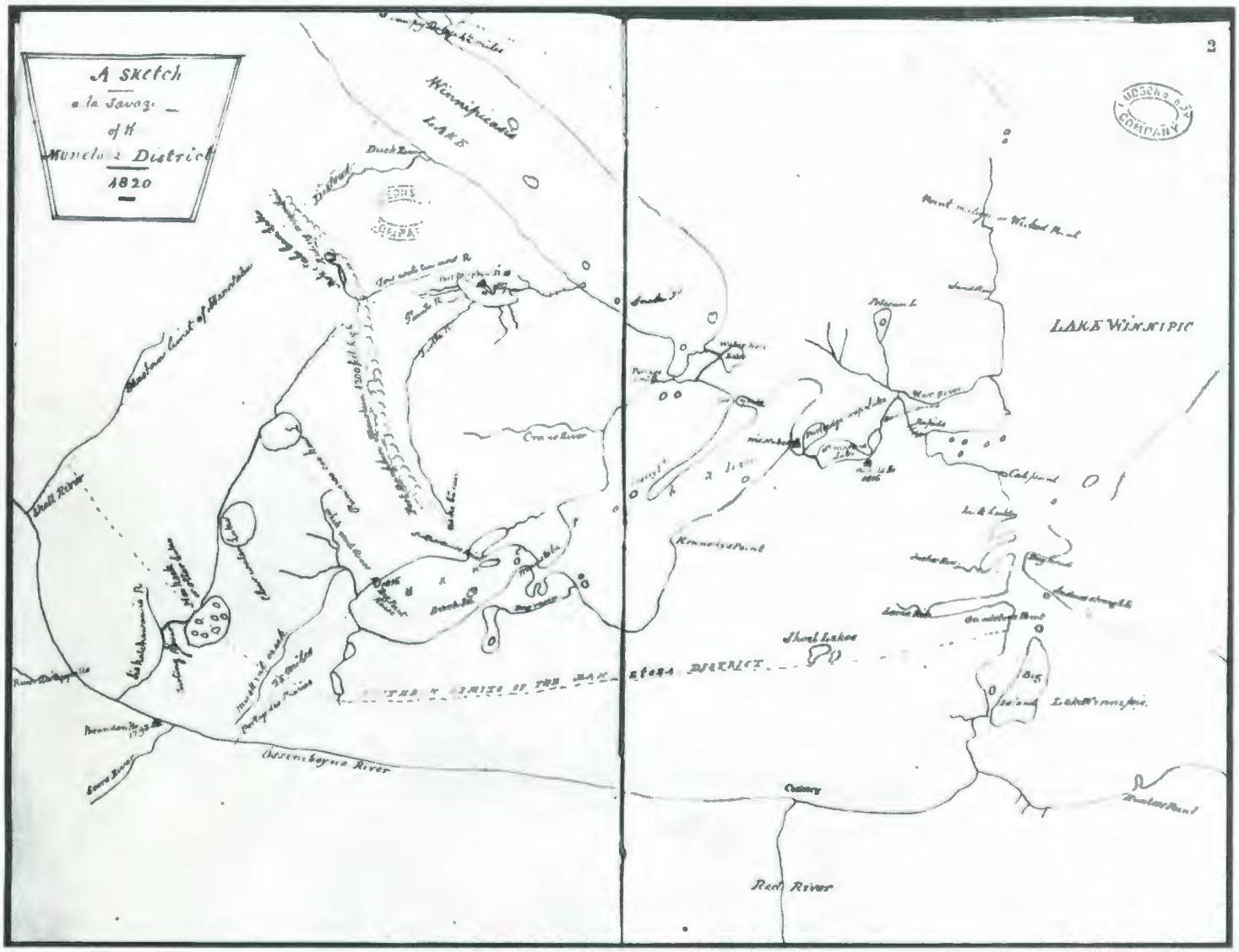
ASSOCIATION OF CANADIAN MAP LIBRARIES

BULLETIN

ASSOCIATION DES CARTOTHEQUES CANADIENNES



Peter Fidler's map accompanying his 1820 report demonstrates Indian mapping techniques.
From the Hudson Bay Company Archives, Provincial Archives of Manitoba

NUMBER 55/JUNE 1985 NUMÉRO 55/JUIN 1985

ASSOCIATION OF CANADIAN MAP LIBRARIES

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Views expressed in the Bulletin are those of the contributors and do not necessarily reflect the views of the Association.

ASSOCIATION DES CARTOTHEQUES CANADIENNES

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A.C.M.L. OBJECTIVES

The objectives of the Association of Canadian Map Libraries are as follows:

1. To promote interest and knowledge of its members;
2. To further the professional knowledge of its members;
3. To encourage high standards in every phase of the organization, administration and development of map libraries by:
   a) providing for discussion of mutual problems and interests through meetings and/or publications;
   b) exchanging information on experiences, ideas and methods;
   c) establishing and improving standards of professional service in this field.

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Editorial

Good News! The co-ordination of the *Bulletin* will be taken over by Bob Batchelder of the University of Calgary, commencing with the September 1985 issue. As many of you may recall, Bob has considerable experience, having served as *Bulletin* editor previously. Best wishes, Bob.

Thus, this is definitely the last issue that we will be producing as interim editors. We would be remiss if we did not take this opportunity to the various contributors to the last four issues and also to extend a special note of appreciating to our copy editing - word processing team, Ed and Liisa Laine.

Tom Nagy _____ *Betty Kidd*

ACML BULLETIN EDITOR REQUIRED

THE POSITION OF *BULLETIN* EDITOR IS CURRENTLY VACANT, AND THE BOARD IS ANXIOUS TO FILL IT AS SOON AS POSSIBLE. EDITORIAL DUTIES WILL COMMENCE WITH THE DECEMBER 1985 ISSUE. WOULD MEMBERS BE INTERESTED IN ASSUMING THIS POSITION PLEASE CONTACT:

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CANADA'S FIRST "NATIONAL" MAP AGENCY: THE HUDSON'S BAY COMPANY

Richard I. Ruggles
Queen's University

The theme, "Mapping the Prairies," is appropriately tailored for most of the papers and discussion reports to be presented at this conference, but its spatial scope is much too restrictive when applied to the transcontinental cartographic activities of Canada's oldest and long-lasting commercial concern. From 1690 to the late nineteenth century, the Hudson's Bay Company draughted and amassed in its active business files the largest collection of maps, charts and plans in Canada, and likely the United States, concerned with private, essentially fur-trading operations. Our discourse is on the history of the cartographic endeavours for two centuries -- 1670 to 1870 -- of the Hudson's Bay Company, which I have dubbed our country's first "national" mapping agency. Our normal perception of the Hudson's Bay Company has not included such a technical pre-occupation; rather it has been that of a "retailing empire" of trading posts and isolated settlements gradually transformed into massive department stores and urban metropoli, including Winnipeg, our host city. Company servants drew maps from Ungava Bay, and from Hamilton Inlet in Labrador to the convoluted coastline of the northwest Pacific and from the Arctic shores of Victoria Land to the intermontane basins of northern California, and especially of the labyrinth of rivers and lakes of the boreal and mixed forests, the parkbelt and prairie grasslands of the continental interior. Company mapping transcended our national borders, but accurately defined its commercial *enceinte*.

The Map Archives

The map collection of the Company -- formerly housed in London, now united with the Provincial Archives of Manitoba, and until recently less well-dated and documented than text materials -- is not as well known to researchers. Maps and charts have been sought after mainly as illustrations for books and articles by historians, geographers, anthropologists and others, but much less for their own intrinsic character and purposes.

The complete roster of maps and charts is not yet exactly known, but by personal estimation amounts to over 4800 items, about 4500 of which are now housed in the Archives. Just under 3000 of the latter are in manuscript form, and about 1500 are printed. Approximately 2100 of the manuscript maps are survey plats of the Lands Department of the Company, dated after 1870. The most significant cartographic heritage of the Company is the corpus of some 578 manuscript maps and charts, and in addition 557 segmental sketches prepared up to 1870.<1>

There is another group of maps, amounting to at least 260, which are not in the Archives, but which did exist, are recorded in the Company's records and whose existence I have substantiated. A few may be viewed in other locations, such as the British Museum, the Clements Library, the James Ford Bell Library, the Royal Geographical Society and British Columbia government files. Most have not been located, and they likely have not survived. But, their "ghostly" nature must be included since they were drawn by Company employees, had form and substance, and played useful roles in Company map history.<2>

Attrition of maps known to have existed in these two centuries is about 30% of the total. The losses may be attributed to such common causes as deterioration of materials as a result of wear and tear, poor housing, exposure to inclement weather, and water spoilage when boat or canoe overturned. Obsolete marine charts may have been jettisoned. Maps may not have been sent on to the home office from the trading houses, or may have been lost en route. Another cause could have been the borrowing of maps from Hudson's Bay House in London, and their non-return to the files.

The Company accumulated about 80% of its pre-1870 manuscript maps and charts after 1800, about 15% were delimited in the eighteenth century, and the remainder before 1700. Unfortunately, the seven maps drawn before 1700 are not in the map collection, the earliest there being of 1709, a marine chart by Samuel Thornton. His more famous father, John Thornton, one of the best-known Thames chart makers, had contracted to provide the Company with at least eleven original charts and copies of Hudson Bay, and of Port Nelson. Only one of these survives, and is now in the British Museum. The Hudson's Bay manuscript and chart collection is a treasure trove, a fundamental source of map images depicting our nation's geographical expansion.

The Company's Mapping Policy

The Hudson's Bay Company did not begin its staples trade in 1670 with an exploratory or mapping policy in mind. It developed its practices piecemeal as it became aware of its requirements. There was no position at Hudson's Bay House entitled Chief Surveyor, Cartographer or Geographer who was responsible for an

exploratory programme, surveying in the field, draughting, maintenance of map files or relations with cartographers or scientific societies at home. It did not open a central draughting room, and incoming maps were maintained in some sort of order, in several map chests and portfolios.

It became the procedure to buy, or to have made the maps and charts which it required. It paid some men to explore, to survey and to map during part of their careers. It encouraged many employees to observe, measure and make sketches in the course of their trading tasks. It purchased surveying instruments, pens, brushes, inks, draughting paper, mathematical tables, text books and map chests, and paid for the repair of instruments. The Company's aim in mapping was to aid the executives and senior officers of the Company to make the necessary decisions in the conduct of their trading enterprise, and the sea captains to navigate safely in the course of duty.

Maps were collected together in London primarily for the use of successive Governors, Deputy Governors, members of the Committee, and others, such as the Company Secretaries. Maps were examined by the officers when the associated annual journals, letters or reports were being read at Committee meetings. They were consulted from time to time. Larger scale maps were used in the compilation of smaller scale regional maps, and by this means the intricacies of the hydrography and trading patterns were made more apparent. The major role of maps was to provide locational and spatial information to officers and servants who were developing an inland trading system. The main exceptions to this general characterization were the maps draughted in the mid-nineteenth century in Fort Victoria for the different colonial purpose of aiding in the subdivision of settlements, and land sales, and of preparing the primary topographical maps of southern Vancouver Island when the Hudson's Bay Company was the proprietor of this British colony.

The special cartographic contribution of the Hudson's Bay Company was not the evolution of unique cartographic designs or methodologies, but lay in the continuing support which it gave to map making as an outcome of exploration and surveying, and as an aid to its business operations. Through wearisome, difficult and often dangerous travail, the Company has provided to our nation the largest private collection of original, primary map documents depicting the geographic form of our emerging national territory.

Hudson's Bay Company Map Makers

Many persons of differing educational levels and having various professions and trades were responsible for the maps and charts used by the Company. A few were commercial chart makers, several were trained in surveying, a number had received instruction in navigation and the use of instruments and several had

some background in draughting maps. However, most of them had had little experience at all in measuring distance or taking bearings, and least of all, in making astronomical observations. Few were proficient in making geographical assessments and keeping proper field notes of their journeys. A few were hardly literate. Most had some years of elementary education, some had been apprenticed to a trade, many were receiving, or had received their apprenticeships as writer or book-keeper in the Company, some had advanced through the ranks in the sea service of the Company, some had some higher education and had been hired for example as medical doctors at the Factories, and a few rare persons had a university education.

In all, about 160 men have been identified as having been involved in preparing these manuscript maps and charts during these two centuries. Also, references are made to over fifty Indian and Inuit persons who provided original configurations used by Europeans, or who sketched maps themselves. Under half of the men produced only one map; a little over one-third of them accounted for two to five maps. Fourteen of them draughted seven or more maps, such as eight from Philip Turnor, eleven each from John Hodgson and from Dr. John Rae, and twelve from George Taylor Jr. in addition to his segmental sketches. The most prolific individual cartographer was Peter Fidler, who was responsible for eighty separate maps, as well as many segmental sketches. Joseph Despard Pemberton and his colleagues in the Company and colonial mapping office in Fort Victoria contributed the largest single block of maps.

From the very beginning of the Company's history officials stated clearly their desire to hire individuals who were willing to move away from seashore Factories, and who would have the ability to observe, and to record their observations while travelling. Nevertheless, almost all were busy, first and foremost, as Company officers and traders, or as servants concerned with a host of regular duties. Most were merely travelling, and incidentally exploring in the course of duty. Several men only were hired specifically for these purposes and spent much of their time on these tasks. Philip Turnor was the first professional appointed as Inland Surveyor. He had been trained and working as a land surveyor in Britain when hired in 1778. After some years, he transferred to the fur trade. The most highly educated and proficient person ever to have been appointed during these two centuries was Joseph Despard Pemberton, trained as a railway engineer in Ireland. He was in Hudson's Bay Company employ for eight years from 1851, and was simultaneously the colonial surveyor for the Colony of Vancouver's Island.

Of the long list of people who were responsible for one or more sketches, or more sophisticated maps or charts, perhaps sixty percent of them could in no way be characterized as having had any training for such work before their employment, nor did

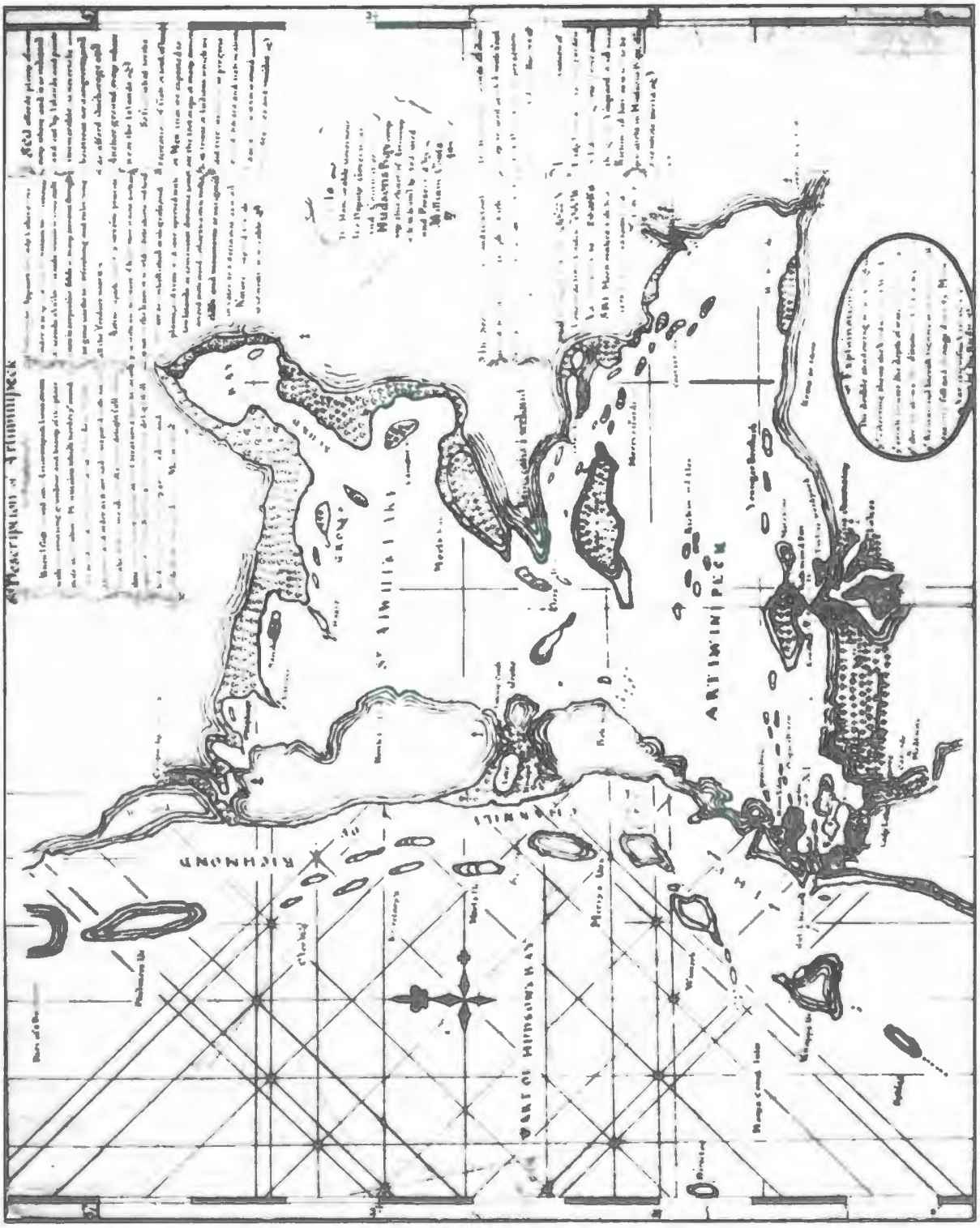
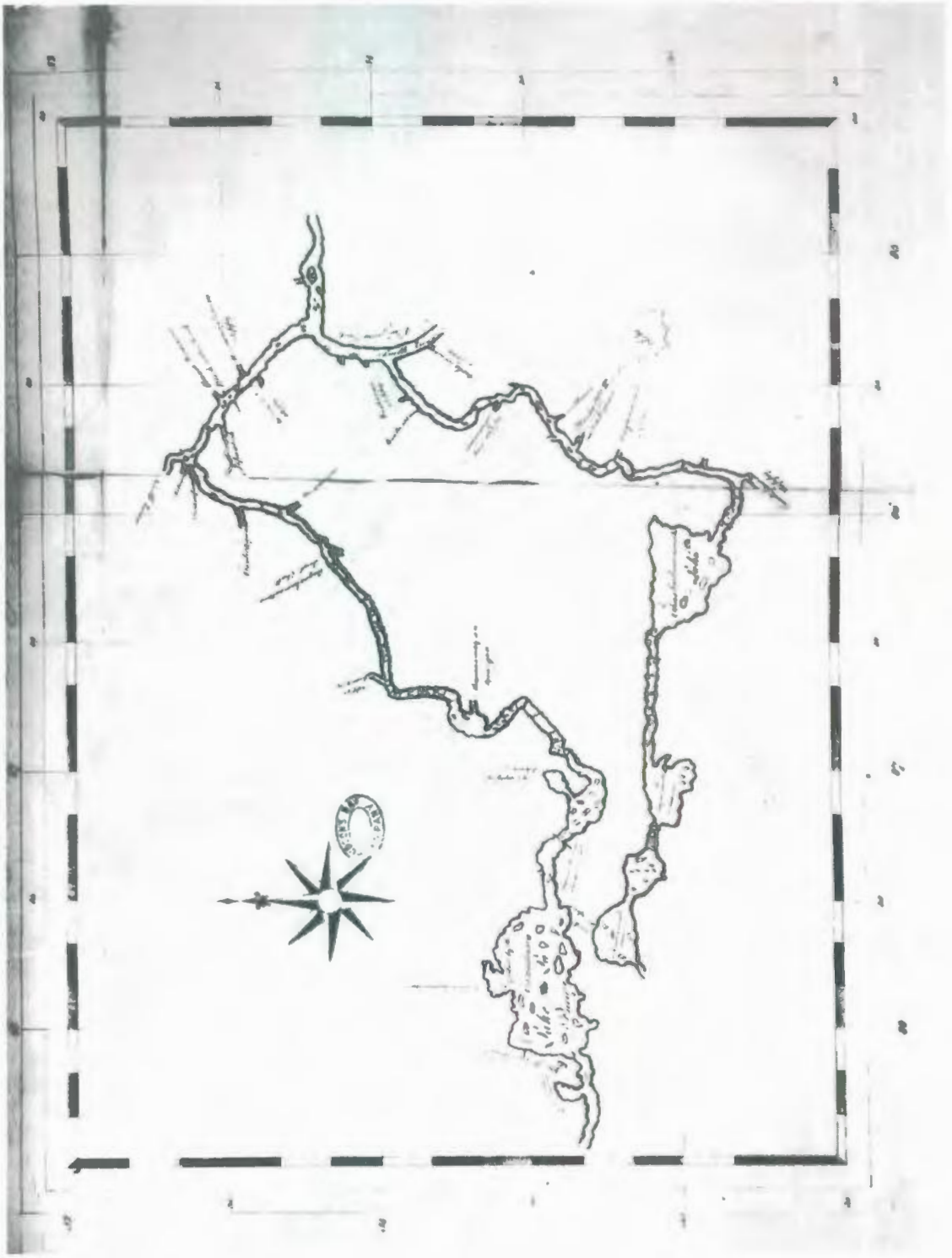


Chart of Artiwinipeck (Richmond Gulf on east coast of Hudson Bay), by William Coats, captain of an Hudson's Bay Company ship, 1749-1750.

(From the Hudson's Bay Company Archives [HBCA], G1/16.)



Several Albany River tributaries above Henley House, by James Hudson, 1788.

(From the HBCA, 886/a/42, fo. 2.)

many ever get any training during their careers. These range from lightly-educated, country-born Thomas Beads, to the well-educated business man and Company director, Alexander Dallas. A further example is Anthony Henday, who was hired as a book-keeper, but who, although a superb inland traveller, was not according to Chief Factor James Isham "...very expert in making Drafts with Accuracy or keeping a just Reckoning of distances other than By Guess which may prove Erroneous."(3) Henday's rough sketch of his historic journey into western Alberta was made into a fair copy by Isham, but sadly, both have disappeared.

A second group, like the first, had had no surveying or cartographic education, but were given the opportunity during their careers to learn and and get experience from confreres, and particularly from Philip Turnor. Peter Fidler was Turnor's star pupil. Thomas Hutchins, Chief Factor at Albany sent his servant, George Sutherland, out along the James Bay shore "...to initiate him into the manner of taking his Course by the Compass, computing his Distance, & observing the Sun's altitude; that he may be the more expert at it when he goes inland."(4) He was sent off, reached Lake Winnipeg, and recorded his travels in a journal, which his senior officer described as "...though defective very much in Orthography and Grammar and in many places more whimsical than useful, yet contains several Observations worthy of consideration."(5) Several such as Hutchins, Edward Jarvis, John Potts and John Rae were "surgeons" to the Company. Being better educated all became adept at the use of surveying instruments and of making astronomical observations without much difficulty. Dr. Rae, who was appointed leader of the Company's Arctic expeditions, was trained in Toronto by John Lefroy, director of the magnetic observatory there.

David Thompson typifies the third group of Company personnel who explored, surveyed and draughted maps for their employer. These were young boys, usually 14 or 15 years of age when hired as apprentices from the Grey Coat and Blue Coat Hospitals in London, largely because they had been members of the mathematical classes of these institutions.(6) They were taught there to write properly, could do basic arithmetic, could sketch, make basic measurements, had some experience with instruments such as a compass, could read, and compile simple maps and charts. They had been taught basic navigation. Twenty-one such apprentices were hired, mainly in the eighteenth century; several went into Company ships, and seven were involved in exploration and mapping, the most significant being Thompson, John Hodgson and George Donald.

The Company made use of sailors who could handle navigation instruments, could fix the ship's position, knew something of simple topographic surveying and and could prepare navigation charts. At least twenty-eight maritime persons, including seve-

ral who were Royal Navy captains, prepared charts or maps which entered the Company's files.

The fifth group were the most specialized, that is, those who like Turnor and Pemberton were trained originally as surveyors, engineers, architects or draughtsmen. There were at least a dozen of these who were hired by the Company. Joseph Robson, who was a builder and stonemason in the construction of Fort Prince of Wales, could handle simple land surveying. Several were practiced surveyors and draughtsmen who worked in the Columbian region, Vancouver Island, and on the mainland, such men as Adolphus Lee Lewes, William Newton and H.O. Tiedemann.

Finally, there was a diverse group of differing abilities, who were employed in a variety of cartographic duties. Boyd Gilmour and George Robinson, who were managers of the Company's coal operations on Vancouver Island, prepared geological cross-sections, plans of mining works and other such maps and diagrams. A.W. Schweiger assisted Dr. Rae in the examination of a possible route for an overland telegraph from Red River to the Yellowhead Pass under Hudson's Bay Company auspices and prepared a master map of the proposed route.

Native peoples were not simply the customers of the fur trade. They were necessary, but unequal partners in this complex operation, often unwilling, and often frustrating for the European participants. Without their cooperation, without their exploratory guidance, without the adoption of many facets of native material culture, the fur trade could not have developed as it did.

Exploration of much of our coastal and interior country by fur traders was in reality the guided examination of the established pathways of original peoples, and discovery, really a Europocentric claim to priority in viewing homelands long familiar to their indigenous inhabitants. Major roles were that of acting as guides and of transmitting geographical knowledge. Officers asked natives about their home areas, what lay beyond their known regions, what routes to take, about trading possibilities, about the environment, and about the cultures of different groups of people. Specific enquiries were made about the number and difficulty of portages and the navigability of rivers. They also invited them to sketch maps of the pattern of waterways, or to comment on maps prepared by the traders.

The Hudson's Bay Company archives of both extant and "ghostly" maps have at least forty-seven which can be called native maps, although all were either traced over or were traced from originals by Company men. Fidler was paramount among Bay men in asking his companions to lay out their knowledge in map form, and he traced over or redrew at least twenty-seven maps of this type. These maps range from very local sketches of river and lake details to small-scale maps stretching for example over

the high plains from the upper Saskatchewan River to the Missouri tributaries and across the Rockies to the Pacific-flowing rivers, or from the Bay shores at York Fort to the Mackenzie mouth across the Barren Grounds and vast forest reaches.

Although there were refusals and evasions involved in working with native peoples, and although many Company officers might have believed that they had spent far too much time and and energy on "...intreaties, Persuasions, Presents and promises,"(7) at times to no avail, the preponderance of such agreements for Indian services were fulfilled and were carried out successfully with reasonable rapport.

Mapping Instructions

Most mappers of the Company followed instructions sent out directly to them by the Committee, or set out for them by Chief Factors or other immediate superiors. On occasion, the Committee gave a general directive, such as that to the factors who were urged to send out active and diligent men among whom at least one should be able to use instruments to obtain the latitude and longitude of places "...by which...[the Committee] may be furnished with intelligible Plans of the Country."(8) These men were to be assured that they would have a suitable reward if they were successful in their explorations.

The type of instructions given servants who were sent inland to winter with Indian bands after 1754 is indicated by that issued to John Potts, who set out from Churchill Fort. He was to prepare a journal of his journey, and in it to note the general course of his trip with an estimate of total distance. He was to note "...the Different Sets of the Rivers, there Currents & also the Falls, how far each Extends, Remarkeing wch are most Dangerous." Further, he was to note all the lakes he saw, was to estimate their "Cercumferences," and take notice of their "Productions," that is, their fishing possibilities. Finally, he was ordered "...to make a Draught of ye Country you Pass Thro with ...[his] Remarks thereon."(9) An implicit purpose was to provide a geographical description of the river and lake network, its fish supply for future travellers, or for post building, and the transport difficulties to be faced. The annotated map would provide a visual summary of the route for the Committee.

There were other orders which were more terse, such as that which George Donald was given in 1777 by Chief Factor Kitchin, who stated that he was to "...take a Draft of the River [Missinaibi] in Your going up if Possible to be Complied with."(10) On the other hand, young Anthony Henday who was sent off on a training trip before his great inland adventure was given voluminous instructions even to outlining his evening routine in camp. He was to make notes on flora and to take soil samples while camp was being prepared, but after supper he was still required to

make observations of water depth, local currents, possible fishing possibilities, and finally to record type of game caught or available. This set of instructions was demanding, and very unlikely to be followed in full during his longer journey, which he did not, but perhaps it was useful as a training exercise.

Difficulties Faced When Mapping

Under normal conditions, exploration and mapping could not be portrayed as a light-hearted occupation in spite of Chief Factor John Newton's avowal in 1749 that he would have liked to have made some measurements above York Fort, as it "...would have been an agreeable amusement at some times."(11) Certain rare employees such as Fidler and Thompson showed by their life-long devotion to mapping that this was their metier, from which they received obvious satisfaction. However, even Fidler, who was on the move more than any other Company surveyor and map maker once refused a task which would have involved much more travel, by asking instead to be given a post master's position since he considered it would hold out more substantial advantages "...than any celestial contacts whatever."(12)

But the records are replete with statements and illustrations of the occupational difficulties and stresses of travel and field survey. The Company had to contend from the earliest days with resistance to inland travel, and found it necessary to develop monetary encouragement such as bonuses and gifts, and also the goad of promises of professional advancement for value received. Travel away from the more established factories and posts always involved fatigue, sometimes overwhelming in its effects, especially when hunger or near starvation was a present spectre due to poor hunting prospects. Miserable weather conditions not only made travel disagreeable and sometimes dangerous, but presaged cold and wet camp-sites and temporary lodgings. Variability of weather had to be faced also. John Work exploring and mapping the Winisk River in 1819 remonstrated about this saying that in mid-June the "Tent in the night was so hot that ...[they] could not sleep -- yet...[the next day was so cold that...[they] had to heap clothes on... [themselves] to keep ...from shivering in the Canoe."(13) Also, especially in the still forests away from clearing breezes, mosquitoes and black flies were the bane of existence. In 1744 at Richmond Gulf on the east Hudson Bay coast it was reported that "ye musketoes Like to Pick out our Eyes."(14) In the forests and out on the grasslands there was the risk of being overtaken by summer fires. Robert Campbell exclaimed at Fort Halkett on the West Branch of the Liard River in June 1839, that the "...fire raging at a furious rate" put the house "in imminent danger." He was "...kept busy all day endeavouring to keep it off, and, and had not a kind Providence changed the wind the Fort must have been inevitable reduced to ashes."(15) Two years later Campbell would almost have welcomed a conflagration as he opined in his post

journal that he was "...as dull and melancholy as ennui can possibly make me,"(16) and three days later, without anyone having arrived for some time he wrote "...I am all alone in these dreary wild Mountains as if I was a misanthrope animal averse to the...society of my species...altho' I am dying of ennui no alternative to submit with Christian resignation to this my present fate or destiny."(17)

The specific problems of observation in the field were manifold. Instruments, so vital to their labours, were often lost, broken, of poor construction or unavailable for various reasons. They were difficult to transport, and being delicate, were at risk when loaded into and unloaded from canoes and boats, being packed on horses, dogs and sleds, or being carried across rocky portages. On the way to Turtle Mountain in Manitoba from Red River, to determine the position of the international border there in November 1827, George Taylor Jr. found that his compass, in a horse-pack, was broken "by the Jolting of the horse." Since then he had "...scarcely seen it once since in a Steady position" and had "...therefore been obliged to give up marking the Courses."(18)

More dangerous to life and limb was the overturning of canoes in storms or rough water, or their stoving-in on rocks, and thereby spilling of their contents, including instruments and maps. Philip Turnor recounted several incidents when he had either lost equipment and associated materials, or they were damaged due to accidents. On the way from Moose Fort across to Michipicoten on Lake Superior in 1781 his canoe hit a stone and sank. His sextant suffered damage from the wetting. The next year his canoe was swamped on the way to Abitibi Lake, and besides numerous other losses, his sextant disappeared in the deep waters and was not found, a loss which was deemed "irreparable."

Low temperatures affected inland mappers in many ways, not the least being discomfort and freezing of fingers, especially when taking observations. Holding metal instruments and putting them to the eye could cause pain and damage at extreme temperatures. Thomas Simpson recalled that in 1836 near Fort Pelly, on an intensely cold night at minus forty-four degrees fahrenheit, he "literally burned...[his] fingers with the sextant."(19) Quite often the intense cold caused the liquid in bulbs and tubes on thermometers and other instruments such as sextants to expand and burst the glass. Low temperatures also affected instruments through differential cooling, and expansion of the metal, especially watches and chronometers. Thermometers, designed to record low temperatures more accurately were prepared for various observers of the Company. Other weather conditions had a bearing on the taking of observations. These were particularly, heavy rains, freezing rain, snow, grey overcast skies, and dense clouds which obliterated the moon, sun or stars. Deep snow made it difficult to travel; soft snow slowed down observers who were pulling thin-wheeled measuring perambulators, which sank deeply

into the snow; and the excessive glare of snow had to be guarded against because of the possibility of snow blindness, a condition which Turnor fell victim to in 1780, on his first expedition up the Albany River.

Obscuring of the skies was at times occasioned by the smoke from forest or grass fires. Taylor, on his way to Turtle Mountain had to face this difficulty, for as he reported, the "...plains were on fire about us, and the smoke arising therefrom was...much against taken the...sights in the morning," but on the following day "...the smoke had augmented instead of having decreased, but between 9 & 10 o'clock the sun began to shew his disk feebly through the sooty exhalations and I observed the... altitudes."(20)

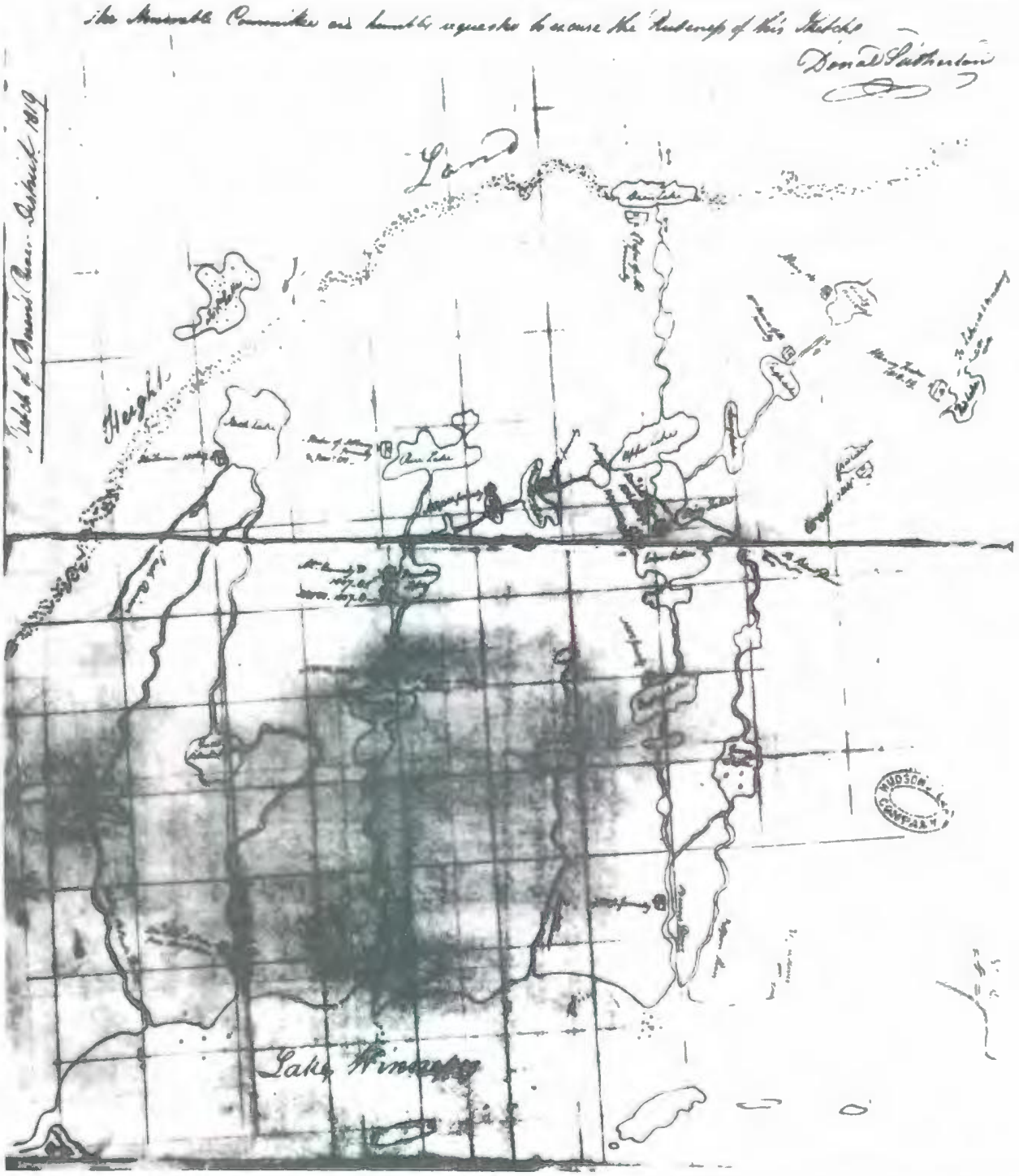
Local magnetic observations, likely due to iron concentrations, affected compass needles, and made accurate reading difficult; and for those explorers in the Barren Grounds and along the Arctic shore, the nearer they approached the magnetic pole, the less they could rely on their instruments.

Observations were not taken on many occasions, or were taken with difficulty or inexactitude for a variety of reasons. The most obvious is that the proper instrument was not available, either because it had not been purchased in London, or if purchased had not arrived in Hudson Bay from London, or had not reached the potential user over the long distances in North America. On occasion, an instrument, sent to London for repair, had not yet arrived back at its destination. More than once a repaired piece of equipment had been returned, improperly calibrated, and therefore useless. The transport lag effect over much of this period, between the loss or breakage of an instrument, or the ordering of an instrument and its receipt in the field, was a difficult matter. Depending on the date, one year, and more often two years, intervened. If the request for, or the repair of an instrument could be got to the Factory at Hudson Bay in late August or early September it could be put on board a ship during its fast turn-around. It could be put on the next year's ship in late May or early June, and would arrive one year later. If the ship was missed, two years intervened. Once at the Factory, equipment had to be transported over long distances, and could be, in fact, damaged en route.

The Map Documents of the Hudson's Bay Company

The map documents of the Company did not display either significant innovations in cartographic design or draughting techniques, nor did they inaugurated and sustain a distinctive "school of fur trade cartography." A large share of the output may be classed as sketch maps. Most were black ink line maps, dominated by sea, lake and river outlines. The draughtsmen did not attempt to show much physical and social detail with symbols,

Rivers flowing into Hudson and James Bays -- Nelson, Hayes, Severn, Albany and Moose Rivers -- likely by John Hodgson, 1791. *(From the HBCA, G 2/28.)*



Berens River District, northeast of Lake Winnipeg, by Donald Sutherland, 1819.

(From the HBCA, 816/e/2, fos. 3d, 4.)

the most meaningful for the trade being river obstructions such as rapids and waterfalls, often expressed as "portages." Now and then only was there an attempt at simple terrain depiction, reference to vegetation, or the plotting of native tribal locations. In their main lineaments these were reference maps essentially, similar in form to those sketches compiled by other fur traders in the continental interior, and by other travellers passing across previously uncharted lands. Few of the map makers used colour on their draughts or added decorative elements such as cartouches. Many of them were not provided with scale information and references to the date of preparation, the area depicted, or authorship.

Maps were often prepared on separate sheets, but many others were drawn on the more confined pages of post journals, or were folded and attached to them. At times they were draughted in multiple sheets such as Turnor's fourteen sheet map of the network from Ile a la Crosse to Cumberland House on the lower Saskatchewan, which has not survived apparently. Some sheets were glued together on a linen or canvas backing, and in some cases had wooden rails attached, and were hung as wall maps in the Company's offices.

The main exceptions to this general characterization were the large-scale topographic maps draughted in the mid-nineteenth century in the draughting-room at Fort Victoria under Joseph Pemberton's direction. These maps were drawn for the very different colonial purpose of aiding in the subdivision of settlements, and land sales, rather than contributing to the operation of the fur trade. The most important innovator in the history of Company cartography was Peter Fidler, who developed the mapping method used during travel, of drawing large-scale segmental sketches in his journal, with distance and direction annotations, which detail was compiled on his smaller-scale maps.

Map Types

There was a considerable diversity of map types, although as could be expected in an expanding commercial operation of this nature, the largest group included the detailed sketches and intricate tracery, at many scales, of the rivers and lakes which formed the trading networks through the country (thirty-seven percent). These are planimetric or topographic maps dominated by hydrographic features -- their connections, crucial crossing-points, difficulties due to waterfalls and rapids; the numbers, locations and difficulties of portages; and hopefully, easier passages from sea to sea afforded by channels or straits, which circumvented difficulties across large land masses.

The second class of maps, embracing just over one-third of the documents were those at larger scales of the immediate environs of fur posts and Factories; Company officers were concerned

with the siting of their buildings, and as well, other land use on Company property. The roads, building locations and property patterns of villages and towns, lot subdivisions and rural field patterns and farmstead details became much more the subjects of mapping in the nineteenth century, and particularly on the west coast.

Safety at sea, coastal sailing during trade expeditions, the investigation of harbours, and the establishment of port sites at river mouths, resulted in the production of about fourteen percent of total cartographic effort.

Many maps were special purpose ones, prepared to illustrate specific functions. These included the maintenance for about a decade of beaver conservation preserves on islands in James Bay, for which purpose the beaver ponds and beaver houses were mapped and inventoried on several occasions. A considerable diversity of maps was forthcoming from the exploration and examination of coal deposits on Vancouver Island, from the coal mining operations at Nanaimo, and from the sale of the operation to another coal mining company.

There were many other groups of maps which reflected the Company's participation in many facets of political, administrative and economic life; these included native land treaties, the telegraph line survey from the Red River to the Pacific, and farming operations at several trading centres, and especially of the adjunct Puget's Sound Agricultural Company's operations at Nisqually and Cowlitz in Washington Territory, and in the Esquimalt district of Vancouver Island.

The Pattern of Company Mapping

Surveying and mapping by and for the Hudson's Bay Company proceeded at first in Hudson and James Bays and Hudson Strait, as the newly-chartered enterprise examined the coasts and established the shipping lanes of this great embayment during the formative years of the trade. Because more accurate charting was continuously essential for the ship captains both on the east and west coasts, coastal charts and river mouth surveys appeared throughout the centuries. Concomittant with these documents were the sketches derived from coastal exploration by trading expeditions, especially after 1740, and extending right into the mid-nineteenth century. Inland exploration and mapping predominated in the basins of the rivers flowing into the Bay, that is, the Nelson-Saskatchewan, Albany and Moose systems during the decades of the 1770's through the 1820's and the Churchill system, somewhat tardier, in the 1790's and later. Cartographic depiction of the Mackenzie basin and the Yukon, although commencing in the 1770's by other than Company people, was predominantly concentrated from 1790 to 1860 by Company men, and preeminently in and after the 1820's.

East of the Bay, inland movement was initiated much later than to the west, and mapping of Quebec interior rivers and lakes from Eastmain to Ungava in Labrador and south across to the St. Lawrence north shore was interspersed to the greatest degree through the five decades after 1810.

A somewhat similar periodicity may be ascribed to the mapping of the region west of the mountains at first in the 1820's and 1830's in the Columbian and Snake River country, Thompson River District, and along the Northwest coast. The Puget Sound and Southern Vancouver Island regions became the scene for the initiation of detailed land surveys and map production in the 1840's and 1850's, which reached a crescendo in the last two decades under review. With the establishment of colonial government on the British Columbia mainland, the Company played some part in the delineation of the interior and the plotting of early townsites there.

Finally, the last frontier of the Bay's mapping cycle, that of the Arctic shores, was inaugurated by Dease and Simpson in 1837, and from that time for some thirty years exploration, surveying and mapping were honourable exercises for the skill, fortitude and daring of a small number of Hudson's Bay Company officers.

The mapping undertaken by this significant commercial enterprise was essentially completed by the time of the Confederation of our nation. The resulting maps and charts have become a national resource which is now more clearly defined and analysed. But the epoch of the men engaged in exploring and mapping their trading areas, which have become our national territory, is what makes the history of cartography of the Hudson's Bay Company become so vital a part of our country's development.

Acknowledgement

Grateful acknowledgement is made to the Hudson's Bay Company Archives, Provincial Archives of Manitoba, for access to its records.

Notes

1. These are manuscript sketches of river and lake courses, drawn in small segments and sometimes discontinuous, by two map makers, Peter Fidler and George Taylor Jr. A chronological

catalogue of the extant maps has been prepared by R Ruggles and is available at the Hudson's Bay Company Archives (hereinafter HBCA), Provincial Archives of Manitoba, Winnipeg, Manitoba.

2. A chronological catalogue of these maps has been prepared by R. Ruggles and is available at the HBCA.

3. HBCA, A.6/9, fo. 33d.

4. HBCA, A.11/4, fo. 52d.

5. HBCA, A.11/4, fo. 73.

6. R.I. Ruggles, "Hospital Boys of the Bay," *The Beaver* (Autumn 1977), Outfit 308:2, pp. 4-11.

7. B.86/b/2, fo. 13.

8. HBCA, A.5/2, fo. 23.

9. HBCA, A.11/14, fo. 31d.

10. HBCA, A.11/44, fo. 44.

11. HBCA, A.11/114, fo. 135.

12. HBCA, A.11/18, fo. 24.

13. HBCA, B.198/a/58b, fo. 11d.

14. HBCA, B.59/a/9, fo. 10.

15. HBCA, B.59/a/9, fo. 8d.

16. HBCA, B.85/a/11, fo. 5d.

17. HBCA, B.85/a/11, fo. 6.

18. HBCA, B.235/a/10, fo. 31.

19. Thomas Simpson, *Narrative of the Discoveries on the North Coast of America. Effected by the Officers of the Hudson's Bay Company During the Years 1836-39* (London, 1843), pp. 38-39.

20. HBCA, B.235/a/10, fo. 28.

INDIAN MAPS IN THE HUDSON'S BAY COMPANY ARCHIVES

Judith Beattie
Hudson's Bay Company Archives
Public Archives of Manitoba

The fur traders of the Hudson's Bay Company were dependent on the Indians for both the furs they needed for their economic existence and for information about the location and routes of access to other sources of furs. So it is not surprising that the Map Collection in the Hudson's Bay Company Archives is relatively rich in maps either drawn by Indians or based entirely or in part on information provided by Indians. In discussing and viewing some of these maps, I hope to indicate the variety in the information conveyed and the range in the methods used. "Indian maps" are not a uniform group in approach and execution, and the form used is often dictated by the message to be conveyed.

Many people, when they think of Indian maps conjure up pictographs, petroglyphs or birchbark scrolls. The closest that we have to this idea of an Indian map is a quaint drawing entitled "A Letter from a Scioux Indian" showing three canoes travelling over a Lake,<1> toward a hatted figure representing a European. Although this is one of the few maps in our collection actually drawn by an Indian, without some documentary background this can really provide very little cartographic or geographic information.

Fortunately, the bulk of the maps in our collection were recorded by intelligent and informed men who had a vital interest in transcribing geographical information in as much detail and as accurately as possible and in translating Indian names and providing explanations. During the eighteenth century information from the Indians served to extend the known or recorded area inland from the Bay. In order to show the eighteenth century use of Indian information in mapping, I will briefly mention some of these early examples in the Hudson's Bay Company Archives. For tracings of these maps and more thorough discussion of their significance, I would refer you to the *Manitoba Historical Atlas* by John Warkentin and Richard Ruggles.<2>

An untitled and undated map records the idea of the seventeen rivers beyond Churchill.<3> This story was recounted to

James Knight, then Chief of the Hudson's Bay Posts, by the Northern (Chipewyan) Indians who returned with William Stewart in 1716 from a long overland journey in the Barren Grounds northwest from Churchill. Included is information from Captain Middleton on his unsuccessful search for the Northwest Passage in 1741-1742 which led him to Wager Inlet. All the Indian names on the map are Chipewyan, except the one closest to Prince of Wales Fort "Pokethocoko" which is Cree.<4> My recent research indicates that this map may be the one referred to by James Isham in his "Observations on Hudson's Bay" in 1743.<5>

In "Moses Norton's Draught of the Northern Parts of Hudson's Bay laid down on Indian Information & Brot. Home by him anno 1760"<6>, the area recorded is extended inland into the Athabaska. This map was drawn on parchment, probably by the Indians themselves, and labelled by Norton, and was brought back to England when Norton returned on furlough in 1760. York and Churchill forts are both indicated, with the Grass River-Nelson River route which connects with the Athabaska country. You will notice in both this map and the previous one, the Melville and Boothia Peninsulas are missing and the shoreline between Churchill and Coppermine River, which takes a right angle turn at Melville, Peninsula, is shown extending in one line north and south.

In 1762 Moses Norton sent two Indians, Mea'to'na'bee and I'dot'ly'a'zees, to observe and report on the source of copper to the north. They were away for five years and returned to Churchill in 1767 with a draft map.<7> This map provided more details showing connections inland through the lakes and rivers, but concentrated its efforts on the Coppermine River. In 1772, over fifty years of mapping interest culminated in Samuel Hearne's arrival at the Coppermine River.<8> While his map was not drawn by an Indian, but rather was based on careful surveying techniques by the cartographer, it was dependent to a large degree on the skill and advice of Mea'to'na'bee, Hearne's guide and the same Indian who had been five years on the route for Norton.

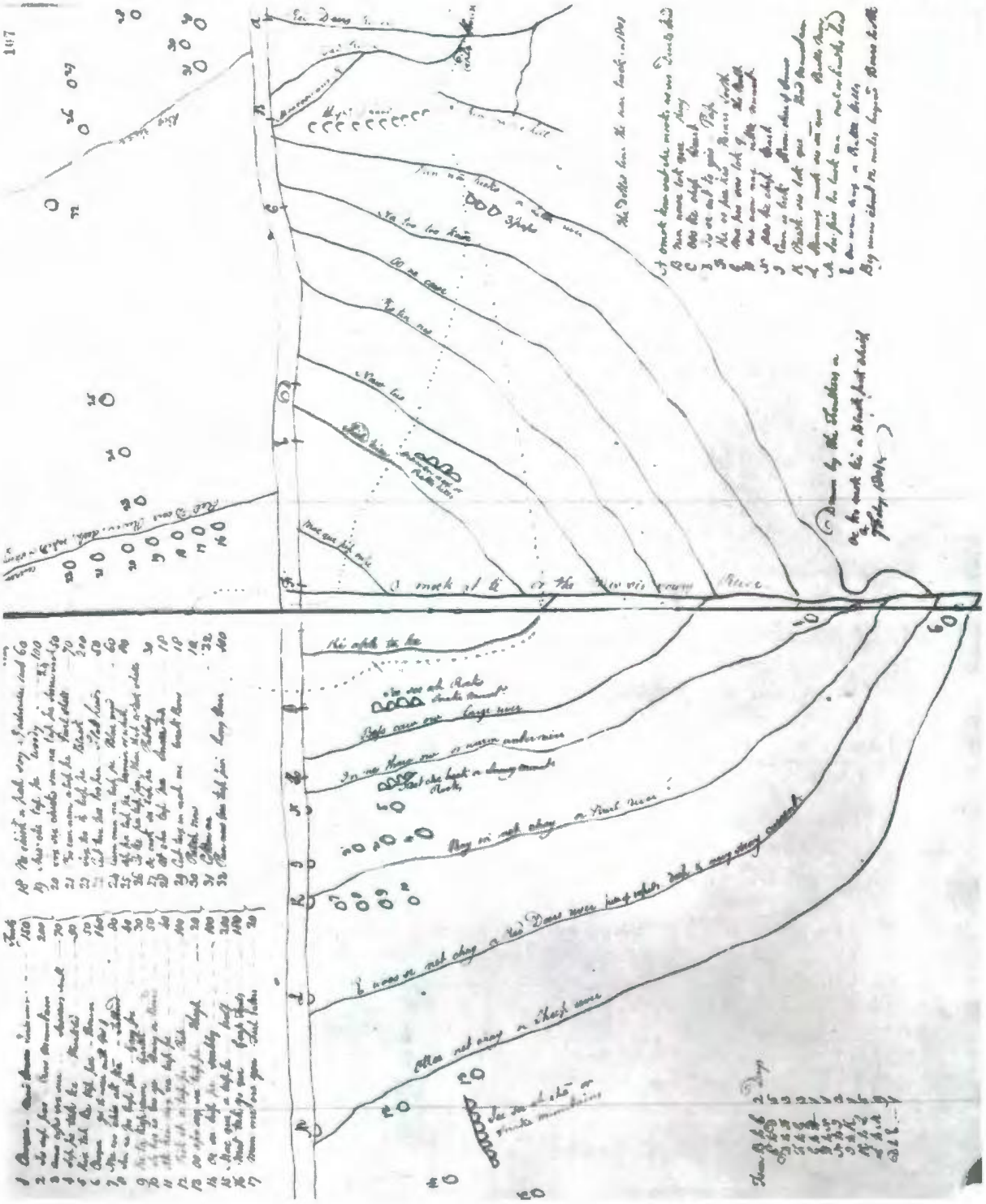
At the same time as mapping based on Indian information was extending knowledge north and west from Churchill, the interior west and south from York and and Albany was being filled-in based on information from fur traders and Indians. Andrew Graham had been encouraging the London Committee to establish inland posts. His letter in August 1772 accompanied by this map convinced these men to move inland resulting in the establishment of Cumberland House,<9> just past Basquia (The Pas), in 1774. In the map Graham acknowledged the sources for his information. The rivers and lakes shaded yellow were discovered by William Tomison, the red by Matthew Cocking and the black from the natives' relations. Most of the shoreline of Frenchman's Lake (Lake Winnipeg) and a few rivers are coloured black.

Philip Turnor used a similar technique to chart the lakes and rivers in North America about 1779.<10> Those areas shaded were from actual surveys and the others from Canadian and Indian information. Here the main extensions by Turnor were up through the Athabaska to Great Slave Lake: from the Indians came information on the Peace and Saskatchewan Rivers. On 25 July 1791 Turnor record Shew ditha da's description of Great Slave Lake, Northern Indian Lake and Esquimay Lake to Hudson Bay which he refused to show them in person because the season was too far advanced.<11>

Peter Fidler, a surveyor for the Hudson's Bay Company continuing in the tradition of Hearne and Turnor, recorded the largest group of Indian maps surving in the Hudson's Bay Company Archives. Since Fidler dates these maps and attributes them to individual Indians, it is possible to examine the methods used and relate them to the creator's individual points of view and to the information to be conveyed. In another paper presented at the History of Cartography Conference in Ottawa this summer, I examined the relationship between creator and product. Here I will try to relate tecnique to content.

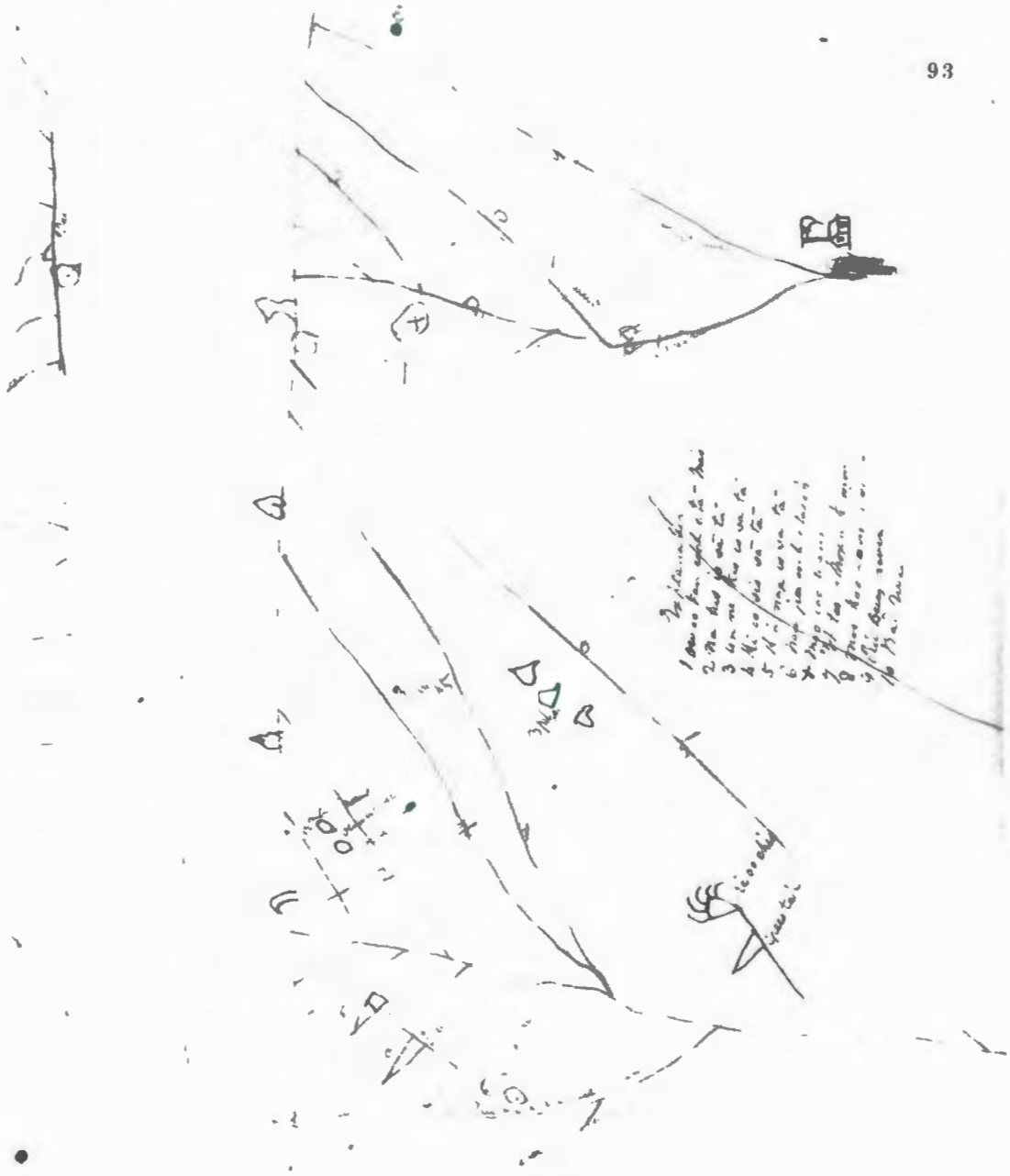
A number of the maps were intended primarily to portray a large geographical area and its major features to traders unfamiliar with the region. A schematic representation was sufficient. The Rocky Mountains were drawn as a straight line across the page near the top, and major rivers were shown flowing from that line. The earliest map of this type, dated 7 February 1801, was drawn by Ac ko mok ki or The Feathers, a Blackfoot Chief who traded with Fidler at Chesterfield House.<12> Since Wayne Moodie has discussed this map in some detail, I shall not proceed with a lengthy analysis of it.<13> It is interesting, however, to compare this with another very similar map by The Feathers dated 1802.<14> In this map more concern is shown with the proper placement of topographical features: peaks are closer to their actual locations with their distances from the main range indicated in miles or nights, and rivers branch in a slightly more natural fashion. Almost the same area is covered in each, though the 1801 map extends farther south to Wyoming whereas the 1802 map ends at point N "Heart" or the Snowy Mountains in Montana. An interesting feature in the 1802 map is the use of symbols for the mountains which were thought by the Indians to represent their shape.

Before we leave the maps by The Feathers, one feature of the 1801 map emerges only in the notebook copy of the map.<15> Starting at Chesterfield House on the right-hand side of the sheet and extending to the Missouri River in the middle is a dotted line represent the "war track in 1801." Annually, the Blackfoot young men travelled to the country of their enemies, the Snake [shoshoni] Indians to the south. Fidler recorded the departure of about 175 young warriors on 30 November 1800 and their return



This map was "Drawn by the Feathers or ac ko mok ki a Blackfoot chief 7th Feby. 1801" and copied by Peter Fidler in his journal of exploration. A detailed analysis of the tribes and geographical features named can be found in D.W. Moodie and Barry Kaye, "The Ac Ko Mok Ki Map," *The Beaver*, Spring 1977, pp. 4-15.

(From the HBCA, PAM, E.3/2, fos. 106d-107.)



A second map by the Feathers was recorded in February 1802, according to the copy made by Fidler in his journal of exploration. Judging by the rather unsteady pencil lines under the ink, this may be one of the few maps held which was actually drawn by an Indian. The peaks represented by symbols are, from left to right, Heart (N on the other map), Bear's Tooth (F), Pap (D), Heart (C), and King (B).

(From the HBCA, PAM, B.39/a/2, fo. 93.)

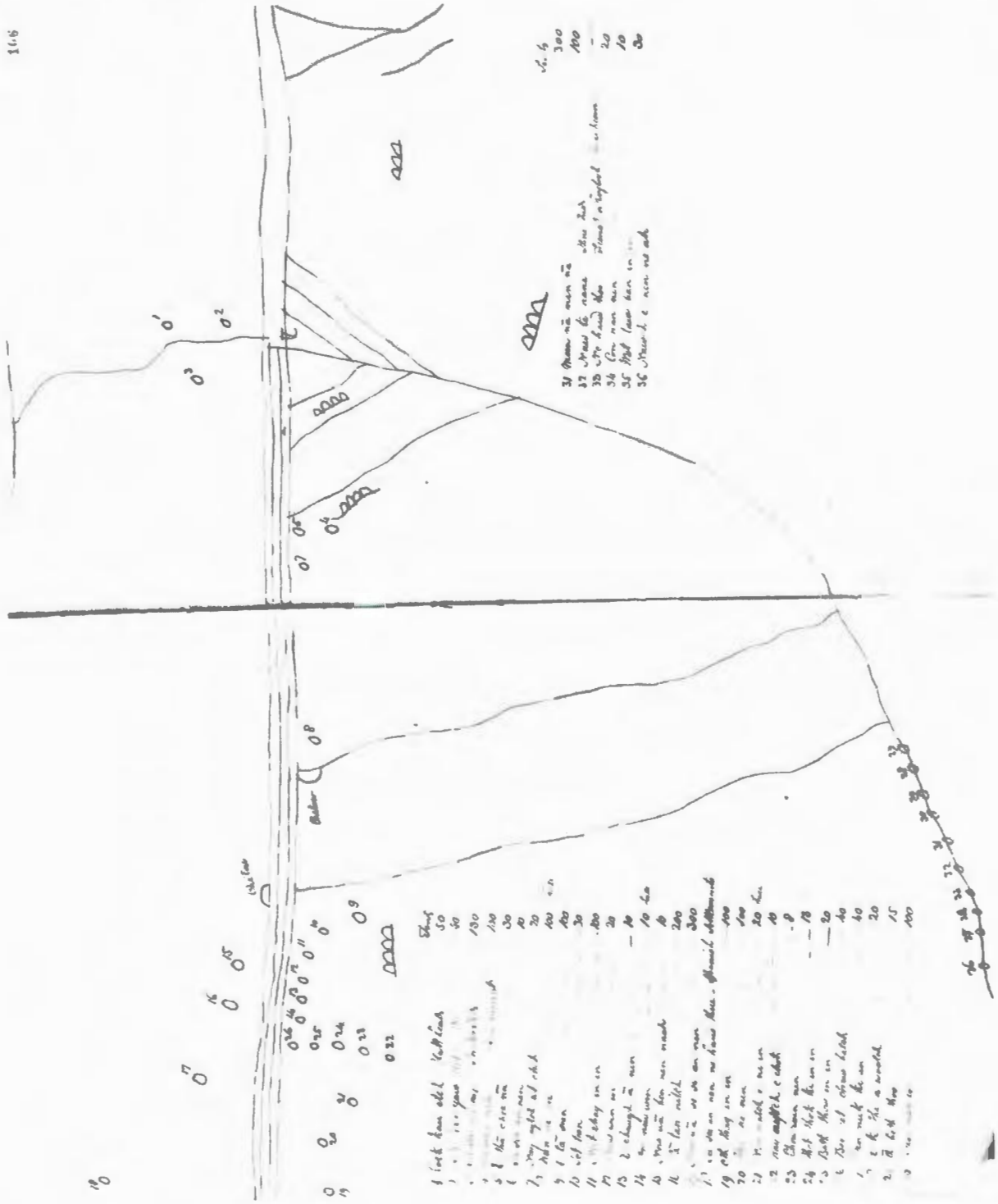
on 10 January 1801, noting with relief that "fortunately they found nobody."(16)

Ak ko wee ak's map of 1802 was similar to the two previously discussed.(17) In his map the geographical area is even further restricted to a region within present-day Alberta, and the tributaries of rivers shown in more detail for the Bad (Bow) and Moo koo was (Old Man) Rivers. But his map, too, records a significant event. Item number 17 indicates the spot, along the Old Man River, were the Fall [Atsina] Indians were killed in 1801. This event led to hostilities between the Blackfoot and Fall tribes which caused Fidler to make a hasty and nervous departure from Chesterfield House in 1802.(18)

Another map extends the area portrayed for the fur traders into the region of Northern California.(19) This map was drawn by a Fall [Atsina] Indian, a fact deduced from the area depicted (the Blackfoot Indians only visited south as far as the Missouri and used Fall Indian information south of that) and the language used to assign the names of tribes. Like the map by Ac ko mok ki in 1801, it was intended to portray in a schematic fashion the rivers and tribes to the south. Of particular interest are the locations of (#18) Spanish and (#33) European settlements. Another map of this type shows the Athabaska River, the Summerberry (Pembina) River and Lesser Slave Lake drawn by Chynky es cum, a Bungee Chief, on 29 May 1809.(20)

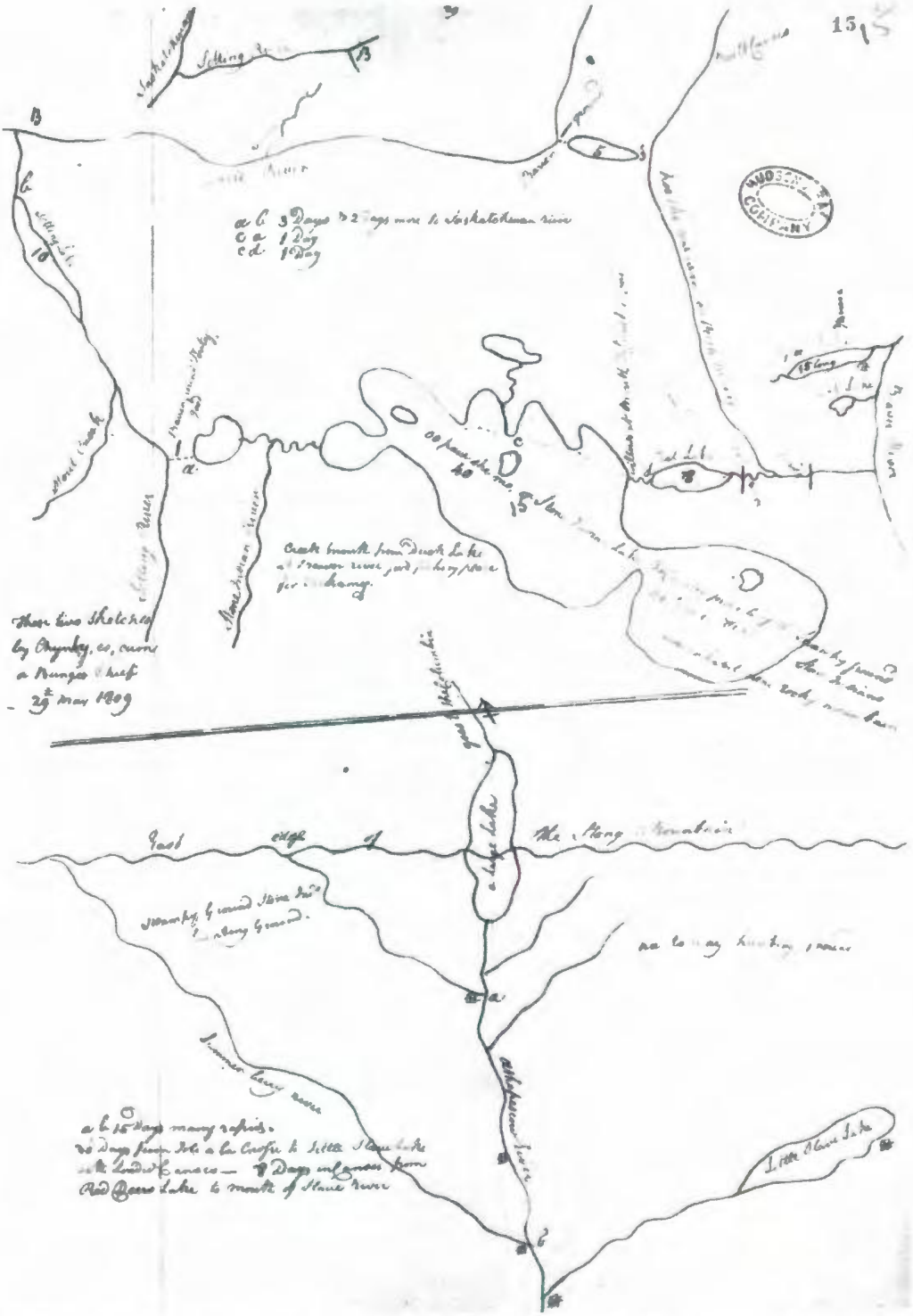
Both as historical records to commemorate events, and as guides to major landmarks, simple sketches were sufficient. But when the Indians' purpose was to show routes, the maps became more complex and lakes and rivers took on truer directions and configurations. The largest number of the Indian maps record by Fidler were route maps. Most were collected by him when he was encouraged by William Auld to survey the Churchill River in 1808 and the Saskatchewan and Nelson Rivers in 1809. From the dates assigned to the various route maps, they were recorded at Reindeer Lake,(21) Cumberland House,(22) Cross Lake,(23) York Factory,(24) Owl River,(25) and Ile-a-la Crosse.(26) The Indians who dictated them were usually those encountered along the route.

The sketch by Chynky es cum, which appears on the same page as his sketch of the Athabaska River system,(27) shows a complex network of rivers and portages in Saskatchewan with a representation of Stone Indian Lake (Montreal Lake) including a distinct shape and showing islands. Cha chay pay way ti drew the alternative routes from Cumberland House to Split Lake.(28) Although there is no shape to the lakes which consist of connected circles and ovals, there is good sequential spacing for the routes. And Ah chap pee, Bungee Boys son's sketch of Pine River from Moose to the Cross Lake dated 1809,(29) shows an exact voyage including portages, paddling times and rapids. It is broken into four parts across the page. There is a definite attempt to give some idea of shape and direction. There are many more of these route



In this map, undated and untitled in Fidler's journal, the area mapped extends well south of that recorded by Ac ko mok ki, with a large proportion of the tribes recorded living south of the Sheep River.

(From the HBCA, PAM, E.3/2, fos. 105d-106.)



"These two sketches by Chynky es cum, a Bungee Chief, 29th May 1809 represent the two major types of Indian maps found in the Archives. The lower sketch records, in a schematic fashion, the Athabasca River and its tributaries flowing from the Rocky Mountains. The upper route map indicates portages and lakes, with "Stone Indian Lake" being given a distinct shape.

(From the HBCA, PAM, E.3/4, fo. 15.)

maps, and each holds its interesting points, but these examples will have to represent all.

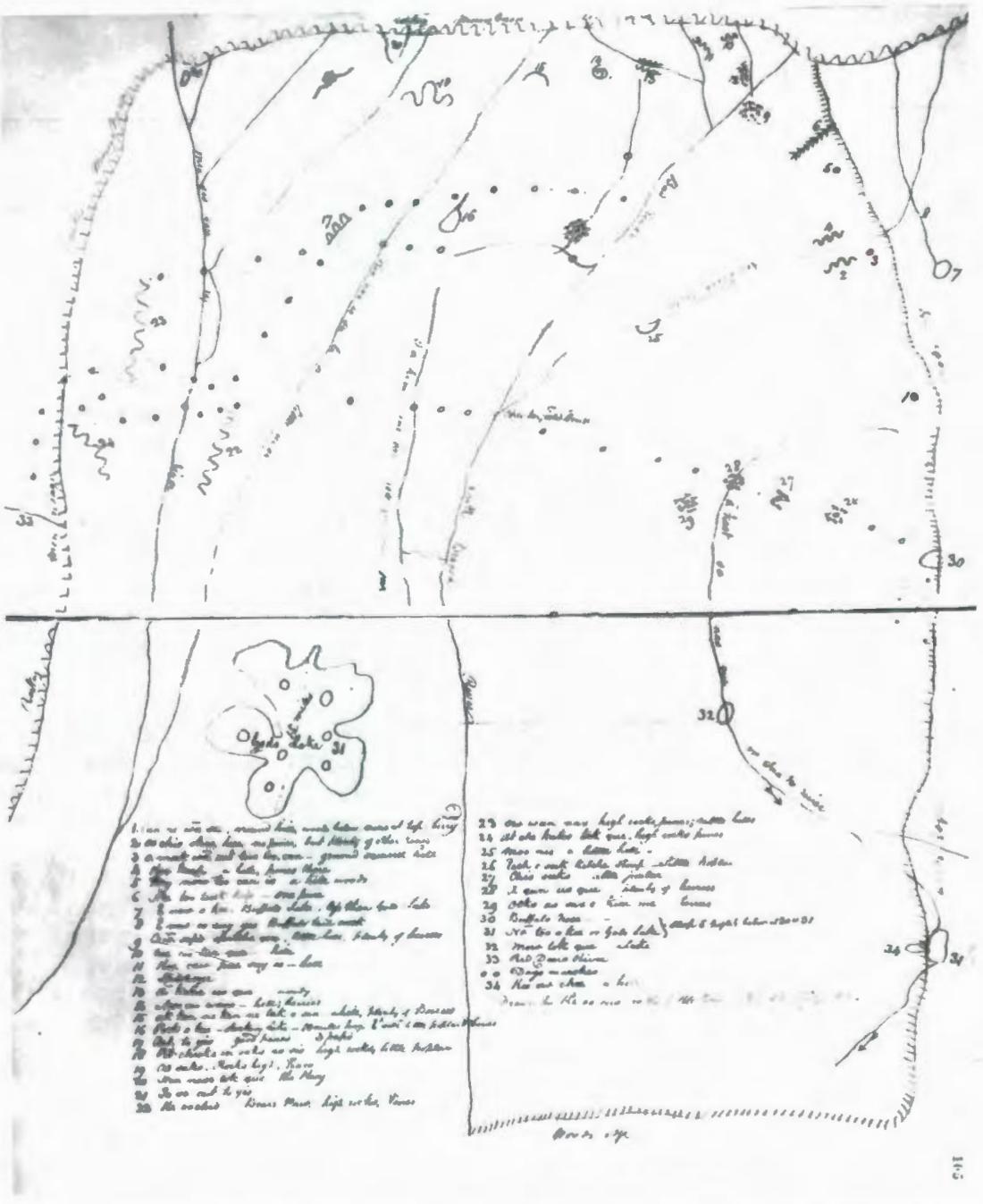
For me, the most interesting of the maps Fidler copied is the map by Ki oo cus or Little Bear in 1802.<30> The detail, precision and variety of geographic information provided, make it a particularly significant Indian map. The first thing that stands out are the boundaries of the map -- the Rocky Mountains on two sides, and the "woods edge" on the other two sides. This is clearly a delineation of the prairies, which Fidler described in a letter to the Governor and Committee in 1802:

> The place marked the Woods edge -- all to the north of that Line is woody either more or less, but to the South in almost every direction for several hundreds of miles, even, far beyond the Crow mountain Indian country, not a single Tree is to be found (by the united testimony of every Indian I have conversed with on the subject) except along the banks of Rivers & Creeks, where in general a little is found, where the different Tribes generally resort; when necessity compells them to leave the rivers & Creeks (to follow the Buffalo) they are obliged to burn dry buffalo dung as a substitute for more substantial fuel.<30>

Identified are major landmarks such as #20 The King (Chief Mountain) or #17 3 Paps (3 Hills) or #22 Bears Paw (Bearpaw Mountains), as well as the most local details #2 hill, no pines but plenty of other kinds, or #9 little hill, plenty of berries. And for #31 God's Lake (Manito Lake) an enlargement is provided with inlets, bays and islands indicated. A number of trails are depicted, with the number of sleeps indicated by circles. The one that goes north and south through Chesterfield House traces the route parallel to the Saskatchewan border just inside Alberta and down into the United States past the Bearpaw Mountains to the Yellowstone River. This follows a route similar to the war-path indicated on Ac ko mok ki's map.

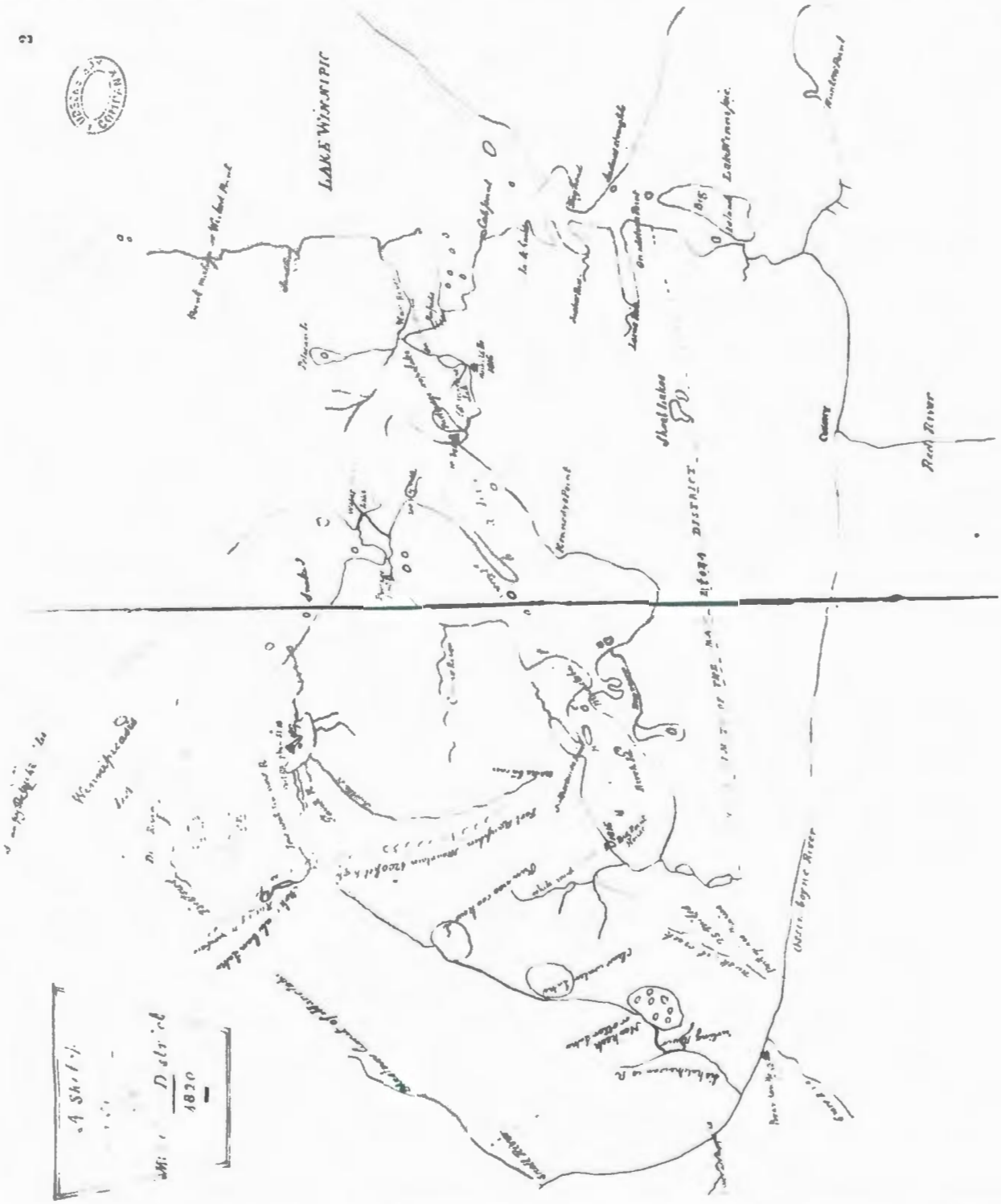
There are number of other Indian maps in the Hudson's Bay Company Archives, but they add little to the theme "Mapping the Prairies," being maps of Severn District in 1815,<32> the Mackenzie River District 1824 and 1834,<33> Labrador in 1842,<34> and the Charlton Island Beaver Preserve from 1838 to 1846.<35> So, I shall finish my presentation with Peter Fidler.

Fidler was so intrigued by the Indian map-making methods that he even copied them. As Fidler wrote in 1802, Indian maps "are of much use especially as they shew that such & such rivers & remarkable places are, though they are utterly unacquainted with any proportion in drawing them."<36> In his Report on the Manitoba District in 1820, Fidler drew a "Sketch a la Savage of the Manetoba District."<37> The map shows a lack of scale and direction, with distorted shapes, but all the significant features are indicated including hills, lakes, portages, posts and



This map "Drawn by Ki oo cus or the Little Bear a Blackfoot Chief 1802" covers the southern part of present-day Alberta in amazing detail. The "woods edge" indicated on the map corresponds surprisingly well with the modern-day prairie's limits when adjustments are made to the flow of the South Saskatchewan ("South Branch") River. The inset enlargement of Gods Lake (Manito Lake) looks suspiciously like one of Peter Fidler's segmental maps and may have been his personal addition to the Indian's sketch.

(From the HBCA, PAM, E.3/2, fos. 104d-105.)



Fidler's final map for the Hudson's Bay Company, drawn to accompany his 1820 report and completed when he was in poor health, depicts the Manetoba District as an Indian would have drawn it -- his tribute to the utility of Indian mapping techniques.
(From the HBCA, PAM, B.51/e/1, fos. 1d-2.)

routes. Though capable of geographically accurate maps based on careful measurements and painstaking draughtsmanship, Fidler deliberately chose to ignore European standards to convey other types of information "a la savage." It is said that imitation is the highest form of compliment, so with this map Fidler was paying his homage to the men whose maps he so avidly collected and used in his long career with the Hudson's Bay Company.

Notes

1. Hudson's Bay Company Archives (HBCA), Provincial Archives of Manitoba (PAM), G.1/330.

2. John Warkentin and Richard I. Ruggles, *Manitoba Historical Atlas: A Selection of Facsimile Maps, Plans and Sketches from 1612 to 1969* (Winnipeg: The Historical and Scientific Society of Manitoba, 1970).

3. HBCA, PAM, G.1/19.

4. June Helm, *Subarctic*, vol. 6 of *Handbook of North American Indians*, ed. William C. Sturtevant (Washington: The Smithsonian Institution, 1981).

5. HBCA, PAM, E.2/2; E.E. Rich, ed., *James Isham's Observations on Hudsons Bay, 1743* (Toronto: The Champlain Society, 1949), p. 182.

6. HBCA, PAM, G.2/8.

7. HBCA, PAM, G.2/27; A.11/14, fo. 78d.

8. HBCA, PAM, G.2/10.

9. HBCA, PAM, G.2/15.

10. HBCA, PAM, G.2/13.

11. HBCA, PAM, B.9/a/3, p. 83.

12. HBCA, PAM, G.1/25.

13. See also D.W. Moodie and Barry Kaye, "The Ac Ko Mok Ki Map," *The Beaver*, Spring 1977, pp. 4-15.

14. HBCA, PAM, E.3/2, fo. 104; B.39/a/2, fo. 93.

15. HBCA, PAM, E.3/2, fo. 106d-107.

16. HBCA, PAM, B.34/a/1, 2.

17. HBCA, PAM, E.3/2, fo. 103d; B.39/a/2, fo. 92d.

18. An account of these events -- as recorded in HBCA, PAM, B.34/a/2 and B.39/a/2 -- has been published in Alice M. Johnston, *Saskatchewan Journals and Correspondence* (London: HBRS, 1967), vol. XXVI.

19. HBCA, PAM, E.3/2, fo. 105d-106.

20. HBCA, PAM, E.3/4, fo. 15.

21. HBCA, PAM, E.3/4, fo. 15d, 16.

22. HBCA, PAM, E.3/4, fo. 15.

23. HBCA, PAM, E.3/4, fo. 11.

24. HBCA, PAM, E.3/4, fo. 11d, 12, 13.

25. HBCA, PAM, E.3/3, fo. 65d.

26. HBCA, PAM, E.3/4, fo. 14.

27. HBCA, PAM, E.3/4, fo. 15.

28. HBCA, PAM, E.3/4, fo. 13d.

29. HBCA, PAM, E.3/4, fo. 11.

30. HBCA, PAM, E.3/2, fo. 104d-105.

31. HBCA, PAM, A.11/52, fo. 1.

32. HBCA, PAM, G.1/33, 34, 35.

33. HBCA, PAM, G.1/52; B.85/a/6, fo. 10.

34. HBCA, PAM, G.1/69.

35. HBCA, PAM, G.1/65; G.1/68; G.1/70; B.186/b/49, fo. 27; B.186/b/51, fo. 25.

36. HBCA, PAM, A.11/52, fo. 1d.

37. HBCA, PAM, B.51/e/1, fo. 1d-2.

INDIAN MAP-MAKING: TWO EXAMPLES FROM THE FUR TRADE WEST

D. Wayne Moodie
Department of Geography

Map-making is among the oldest of the graphic arts and appears to have preceded writing in most of the early cultures for which any significant knowledge has survived. Insofar as the North American record allows, it would seem to have been a well-established art among most, if not all, of the native peoples of this continent on the eve of European contact. Clearly, this was the case in Western Canada, as is evident in the relatively large number of maps drawn by Indians for the early explorers, fur traders and other Europeans who were among the first to travel in the vast uncharted spaces of the West.

Unfortunately, very few of the maps actually drawn by Indians have survived. Rather, most of the artifactual evidence for Indian cartography has been preserved in the form of copies of Indian maps made by Europeans. This is hardly surprising, as most Indian maps were sketched on the ground or in the snow. Indians also drew maps on other media, such as bark, skins and even paper, but almost all of the maps of this nature known from historical accounts have been lost. The graphical evidence for Indian map-making is thus largely confined to the charts that Europeans found of sufficient interest or value to copy and preserve. Although some of these maps may have been altered or influenced in different ways by the Europeans who solicited or copied them, they can with little qualification be considered as *bona fide* examples of Indian map-making.

In Western Canada, most of the maps of Indian origin that have survived were copied by servants of the Hudson's Bay Company and are preserved today in the Hudson's Bay Company Archives, Winnipeg. As a group, they bespeak of an impressive knowledge of geography among the nomadic Indian nations of the West, and of a well-developed ability to convey this knowledge to others in cartographic form. In communicating geographical information in map form, the Indians performed a fundamental, if still largely unappreciated, role in facilitating European travel and expansion, not only in the West, but also in other unexplored or little known parts of the continent. This paper examines two

such maps which in different ways contributed to European exploration and map-making in the western interior of the continent. Drawn by Indians from two different regions of the West for the Hudson's Bay Company fur trader and surveyor, Peter Fidler, they are also representative of the major types of Indian maps.

Although no attempt has been made to classify Indian maps, it is apparent from the surviving evidence that the maps drawn by native peoples for purely geographical purposes can be divided into two main types -- general or area maps, and route maps. The first of these, or the area maps, were drafted with the objective of depicting the geography of an entire area or of a region as a whole. They were thus drawn to portray the main features of an area, or those deemed to be distinctive or significant by the map-maker. The route map, in contrast, was drawn with the specific intention of making a section of country navigable to the map user. On these maps, no attempt was made to fill in space other than that required to permit negotiation of the terrain in question. Thus, only the features of the route thought to be essential to the intending traveller are shown. All else is generally omitted as extraneous or as clutter irrelevant to, or detracting from, the purpose of the map.

What is true of the route maps in this respect is also generally true of the area maps. Although drawn for a different purpose, the area maps are also simple, unelaborated sketches that contain only the features essential to grasping the layout of the country, or the components of it thought to be significant by the Indians in question. This is in great contrast to the European tradition of map-making, wherein all features that can be shown on a map at a given scale are shown, regardless of their significance. This contrast in mapping styles and objectives fundamentally reflects the cirucumstances in which Indian maps were most often employed. As most were drawn on the ground or snow, they were intended to be carried or used as portable aids for navigation or for geographical understanding. In this mode of mapping, the sketching on the ground was accompanied by verbal descriptions, and even dialogues, among those involved about the nature of the country being mapped. The maps so constructed served as graphic displays that reinforced and made more memorable the verbal accounts. They were thus spatial schema to be fixed in the mind of the map-user and to be recalled when the occasion demanded.

Given that Indian maps served mainly as mnemonic devices, native cartographers were naturally most selective in what they portrayed, showing only the features necessary to make a route or a countryside memorable. Thus, even on maps committed to bark, skins or paper, only features of significance were drawn and no attempt was made, as in the case of European maps, to fill in all the space. Both of the maps presented here display these characteristics. The first of these maps is a route map drawn for Peter Fidler by the Chipewyan Indian, Cot aw ney yaz zah, in

APPROXIMATE COVERAGE OF INDIAN MAPS

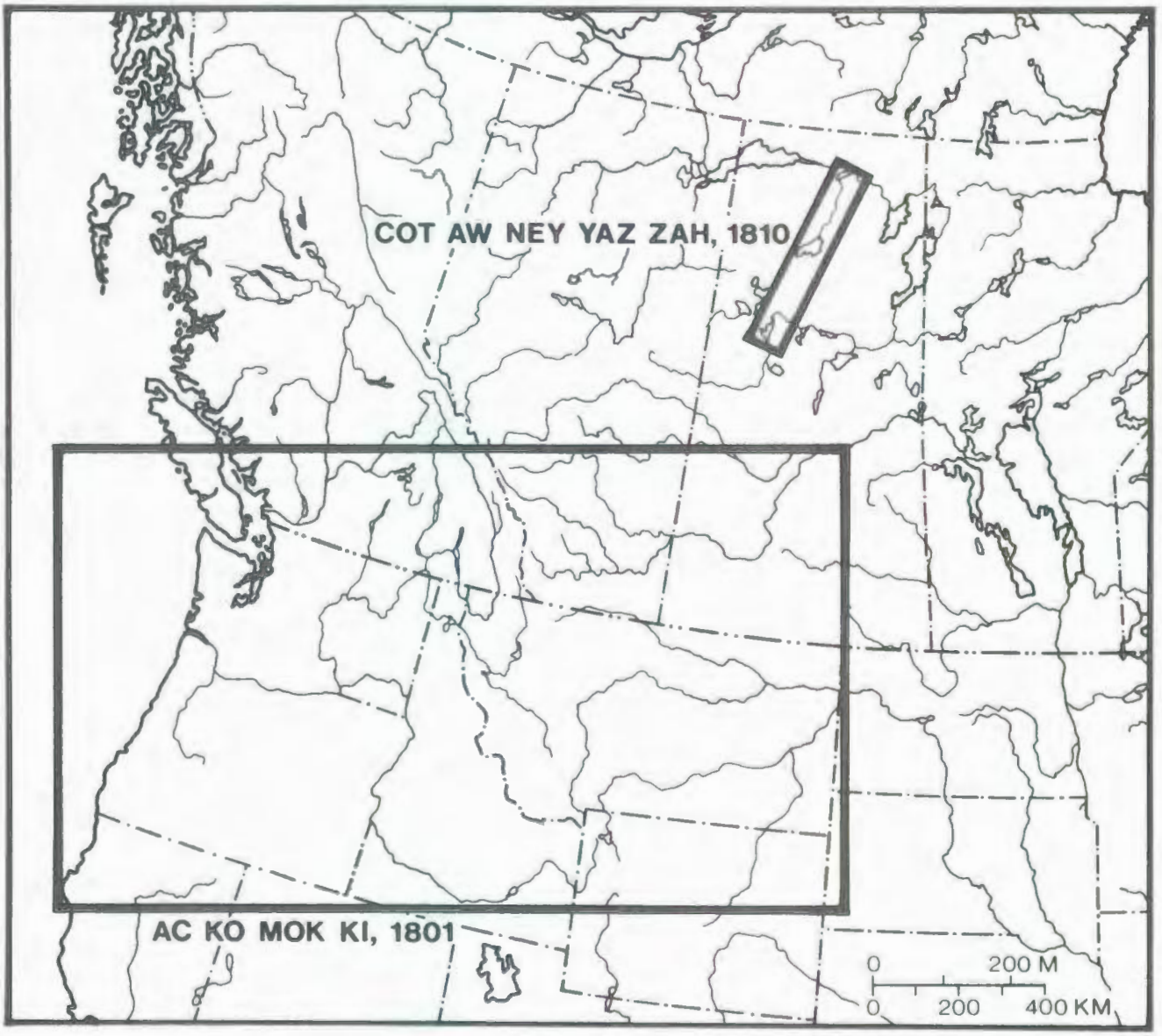


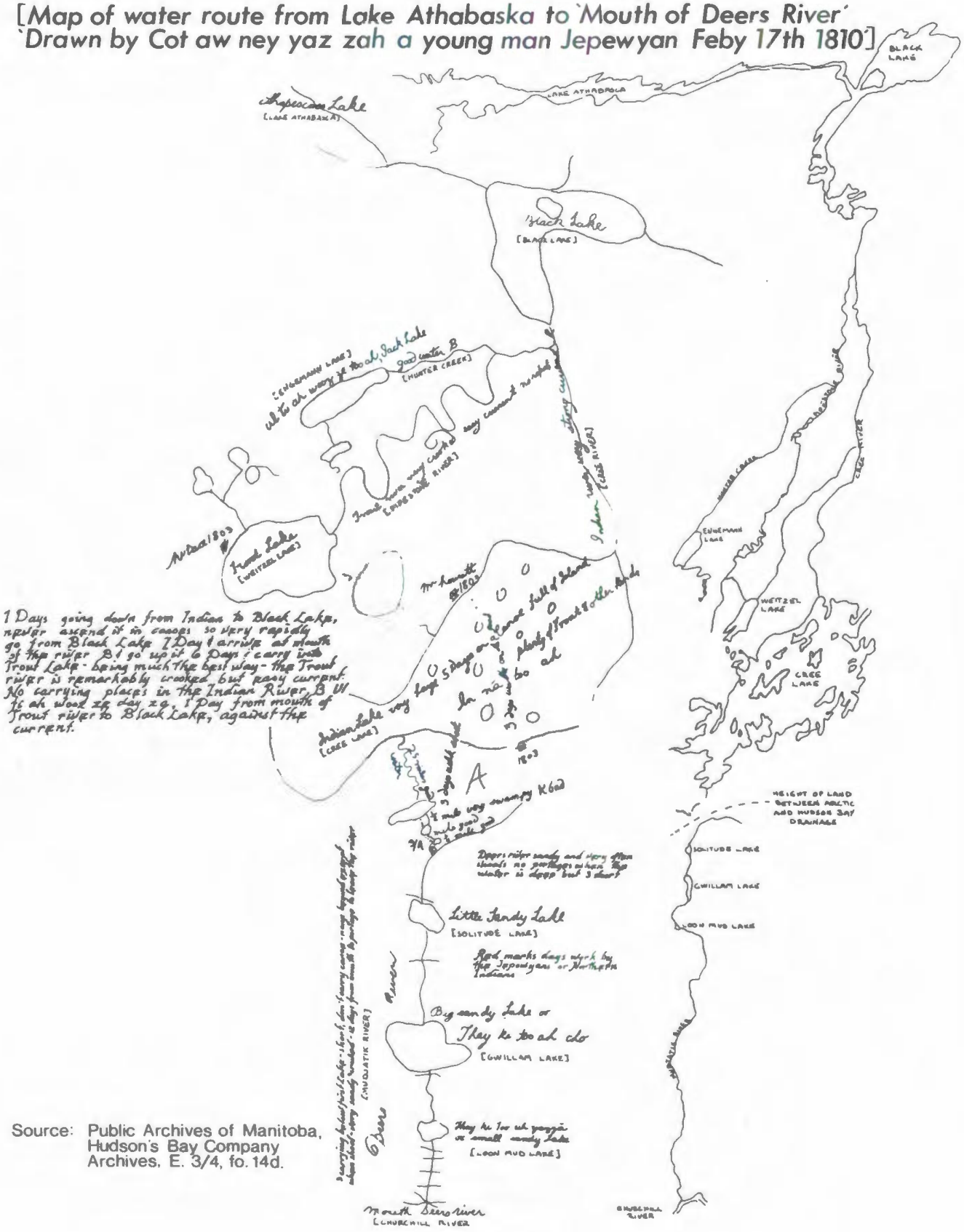
FIGURE 1

1810. The second is an area map constructed for Fidler in 1801 by the Blackfoot Indian Chief, Ak ko mok ki. The approximate areas covered by these two maps are shown in Figure 1.

The Cot aw ney yaz zah map depicts a route across almost three hundred miles of complex, Canadian Shield country lying between the Churchill River and Lake Athabasca (Figure 2). Despite the maze of lakes and streams in this sector of the Shield, the map shows no details of the landscape other than those necessary to navigate by canoe from the Churchill River to Lake Athabasca. Not only did Cot aw ney yaz zah confine his mapping to the route, but he drew only those features of it that he considered necessary for successful navigation. Indeed, the only features that are irrelevant to the way-finding purpose are the three trading posts shown on the map, two of which were located on the borders of present Cree Lake, and the other on Weitzel Lake. This information was undoubtedly incorporated on the map at Fidler's request. Fidler was interested, not only in learning of a routeway to Lake Athabasca, but also of the activities of rival fur traders from Montreal in this region. Cot aw ney yaz zah, who knew of the locations of their trading posts, apparently accommodated this request.

One of he most distinctive cartographic properties of Indian maps is their scale. Shape is generally well preserved, but scale frequently varies greatly from one part of the map to another. This has often been described as a defect in Indian map-making occasioned by their primitive technology. Insofar as this was a weakness, it was inevitably so, as the Indian did not possess survey instruments and drew his maps from memory. Under these circumstances, preservation of true scale on maps embracing hundreds and often thousands of square miles was a veritable impossibility. Nonetheless, many Indian maps show relatively constant scale over huge areas, and where there are scale distortions within them, these in most instances reflect purposeful distortions rather than inadequate knowledge or faulty memory. Not only was the Indian draftsman unfettered by the European concept of a constant scale but, as is clearly evident in the Cot aw ney yaz zah map, he manipulated it to suit his purposes. Viewed in this way, the flexible use of scale can be seen as a great strength of Indian mapping, and not the fundamental weakness that a purely Eurocentric view implies.

From Figure 2, it is apparent that the scale of the Cot aw nez yaz zah map is in an overall sense consistent with that of the accompanying modern survey map. In contrast to the constant scale throughout the survey map, there are great departures from the overall scale within the Cot aw nez yaz zah chart. The most conspicuous of these occurs in the section of the route between the Churchill River and Cree Lake. Thus, the distance up the present Mudjatik River from the Churchill River to Loon Mud Lake is very much condensed on the Cot aw nez yaz zah map, although the small lines or strokes across this stretch of the Mudjatik



Source: Public Archives of Manitoba, Hudson's Bay Company Archives, E. 3/4, fo. 14d.

FIGURE 2

River indicate seven days travel time to ascend to Loon Mud Lake. As this part of the route could be navigated simply with little or no possibility of error, it did not require any elaboration and was given little prominence on scale of the map. In contrast, the relatively short stretch of country to be negotiated between the upper waters of the Mudjatik River and Cree Indian Lake was the most critical section of the route between the Churchill River and Lake Athabasca. This required a complex set of portages following small streams and lakes to cross the height of land between waters flowing into Hudson Bay and those draining into the Arctic Ocean. To ensure successful navigation at this important junction, the detailed hydrographic sequence to be followed is clearly shown by drawing these connections at a scale that is many times larger than that of the map as a whole. Thus, Cot aw nez yaz zah adjusted the scale to suit his purposes and, in this way, was able to construct a single chart that provided all the information necessary for navigation in a manner that reduced it to the simplest or most memorable schema.

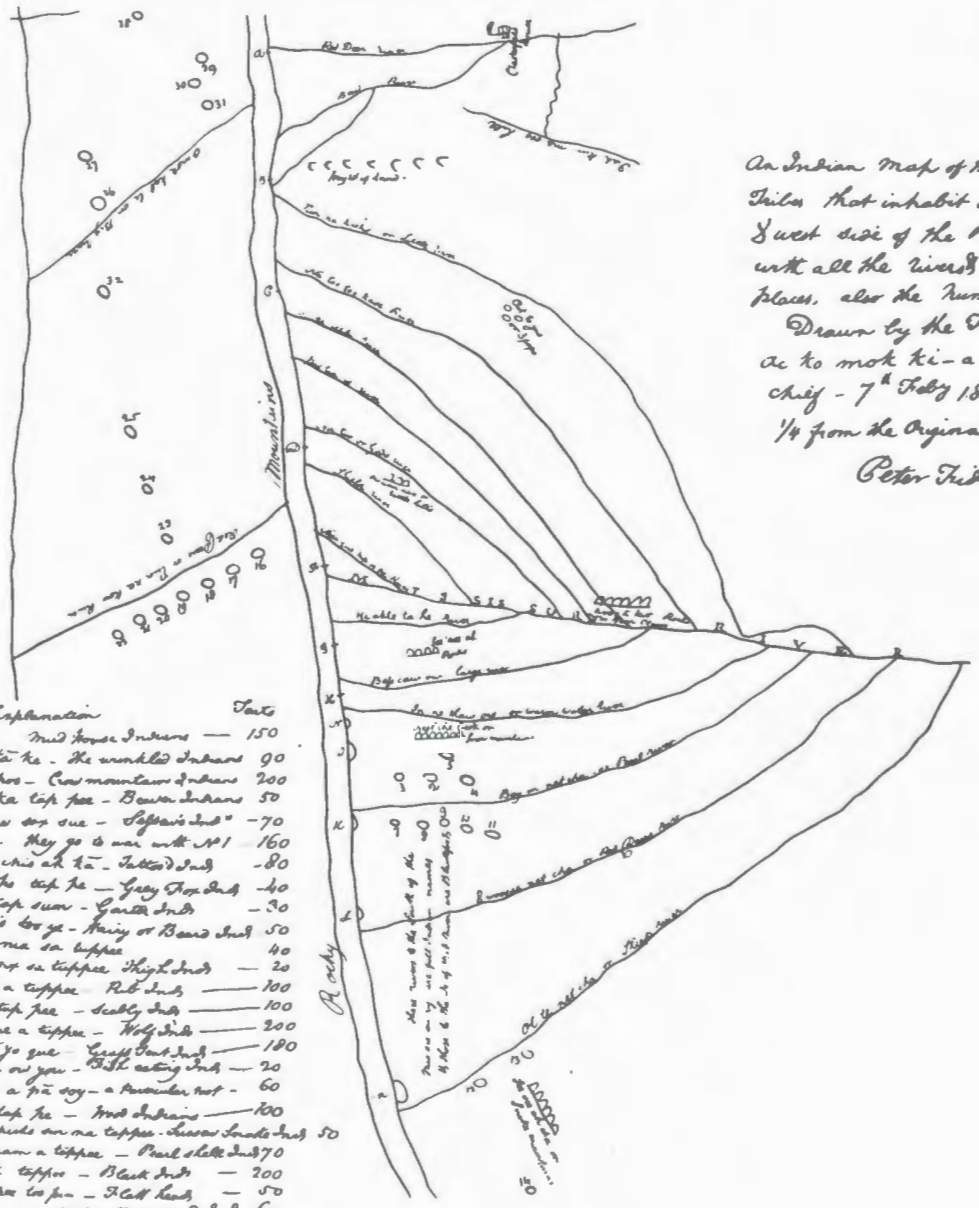
Cot aw nez yaz zah's intimate knowledge, but highly selective portrayal, of the hydrography of the region is further manifest in the northern half of the map, or in his depiction of the streams to be followed in travelling between Cree Lake and Lake Athabasca. Fidler's written directions relating to this section of the map were undoubtedly added to his copy from the descriptions given him by Cot aw nez yaz zah. They indicate that the route from Cree Lake is down the Cree River to Black Lake. They also tell us that, despite the great distance to Black Lake, this part of the route can be travelled in one day because of the swift current in the Cree River. Significantly, the directions also state that the traveller is not to ascend the Cree River in returning to Cree Lake. Rather the return journey is to follow the series of small streams and lakes that Cot aw nez yaz zah has elaborated to the west of Cree River. This feature of Indian travel, and thus of the route maps, is known in the Cree language as an *otāhkwahikan*, which might best be translated into English as a "backway".(1) In a literal sense, these are minor streams situated behind or back from the major ones, but which furnish alternate or more desirable routeways, either because they are less difficult, avoid rapids or other navigational dangers or can be travelled in less time. In this case, Cot aw nez yaz zah has shown what might be called a double backway, and has greatly increased the scale of this sector of the map to clarify the connections and portages required for this alternate, return route. Thus, rather than ascend the swiftly flowing Cree River, the returning traveller is directed to leave the main stream just south of Black Lake to travel west up the smaller, more gently flowing Pipestone River. Because the Pipestone River is described as "crooked" and therefore consuming of travel time, a second backway is to be followed by Hunter Creek. The traveller is then to follow the succession of lakes, creeks and portages that Cot aw nez yaz zah has been at pains to elaborate to eventually reach the northwest shore of Cree Lake. Thus, despite his

obviously detailed knowledge of the country, this Chipewyan Indian cartographer depicted only the information that he regarded as essential for successful travel. He also skillfully and accurately accomplished this task by manipulating scale in a manner foreign to European cartography but admirably suited to his task.

In contrast to the Cot aw ney yaz zah map, that drawn for Fidler by the Blackfoot Indian, Ak ko mok ki, is an an area map that depicts a huge portion of Western North America (Figure 1). This map is one of several that Ak ko mok ki drew for Fidler while the latter was stationed at Chesterfield House on the South Saskatchewan River and is the most ambitious of the Ak ko mok ki charts. As can be seen from Figure 3, it extends from the Red Deer River of Alberta in the north to the Rattlesnake Mountains of Central Wyoming in the south. In its east-west dimension, it encompasses the western half of the continent, stretching across the vast sweep of country lying between the Big Bend of the Missouri River in the east and the shores of the Pacific Ocean in the west. In all, the map depicts an area of approximately 1,000,000 square miles. Although scale variations occur throughout it, and some sections are shown in limited detail, the fact remains that this Blackfoot Indian Chief was able, at the request of a fur trader, to conceive of and sketch out the main features of an area rivalling that of Western Europe in size.

The major scale variation on the Ak ko mok ki map occurs along the line of the Rocky Mountains. The country lying to the west of the Rockies has been greatly reduced in width compared to the area of plains environment shown to the east. As a result, the true east-west dimension of the map is significantly distorted, such that Ak ko mok ki's draft is greater in its north-south dimension than in its east-west one. In terms of the country encompassed by the map, the reverse is actually the case. The magnitude of this distortion, and hence the deceptive nature of the map, can be seen readily by comparing Ak ko mok ki's sketch with the area that it actually covers shown in Figure 1. The only other scale variation of note occurs within the plains section of the map. The grasslands to the north of the Missouri River have been drawn at a larger scale than those to the south, and have thus been given somewhat more prominence on the map. Otherwise, scale is well preserved and relative distances between locational features display little distortion.

The Ak ko mok ki map is centred upon the line of the Missouri River and, perhaps at Fidler's request, elaborates the entire drainage network of the river from its sources in the Rockies to its Big Bend in North Dakota. In the north, it shows the height of land separating the waters of the Missouri, which flow into the Gulf of Mexico, from those draining into Hudson Bay via the headwater tributaries of the South Saskatchewan River. It also identifies the most remarkable mountain features that occur along the eastern flank of the Rockies. In addition, most of the hill lands and mountain outliers that extend into the plains to the



An Indian Map of the Different Tribes that inhabit on the South & west side of the Rocky Mountains with all the Rivers & other remarkable places. also the Numbr of Tents Drawn by the Feathery or Ac ko mok ki – a Black foot chief – 7th Feby 1801 – reduced 1/4 from the Original Size – by Peter Fidler

Explanation — Tents

1 Cho que – Mud House Indians — 150
4 Sip pe tā ke – the wrinkled Indians 90
2 Ne sep pos – Cree mountain Indians 200
5 Kis tā ke tup pee – Beaver Indians 50
3 Amo cope ay sue – Sapparie Ind° –70
6 Cho que. May go to war with N°1 160
7 Wee tow chis ah tā – Tatted Ind° –80
8 Sin ne pe tup pe – Grey Horse Ind° –40
9 Ne tā kup suow – Gantle Ind° –30
10 Se koo is tay ye – Many or Beard Ind° 50
11 Ah ken ma sa tippee 40
13 Oo ape ay sa tippee Right Ind° — 20
12 Pik ot a tippee Rib Ind° —— 100
14 Oc sa tup pee – scalby Ind° —— 100
15 Mah que a tippee – Wolf Ind° —— 200
16 Mah tā yo que – Crafty Beat Ind° —— 180
17 Mow ma ow you – Bile eating Ind° — 20
18 Ne chick a pā say – a Mountain rat – 60
19 Kis ske tup pe – Mad Indians —— 100
20 Esp ne chisks ow ma tippee – Swear Snake Ind° 50
21 Po cow naw a tippee – Pearl shell Ind° 70
22 Sep tā k tippee – Black Ind° — 200
23 Cut tus pee tay pe – Calf heads — 50
24 Cum mow ma tippee Blue mud Ind° 60
25 Ap pe tippee – Common or White Ind° 80
32 Paw mus pee tup pe – Long hair Ind° 100
27 Ac cook sa tippee – Pasling Ind° – 80
26 Te kee pee tup pe – Nose that collect scabs
28 At sha tippee – Hair Indians — 18
29 Cut tup ow nā me – Weak bow Ind° —18
30 Petah now —— 10
31 Cotton nā —— 22

Explanation

A Devils head – or Smoak ow nah she mooks as ow
B Hung – Arm nose tok que
C Heart – Us ke chup
D Pap – Cuff to you
E Bears Teeth – Kis se pe kes
F – Me Beit – Me pis. sees L & Q
G – Me Rattle – Owsow naw
H – Me Heart – Us ke chick
I – Snow mountain – Coom o tak
K Bad mountain – Pauch us tok que.
L Bulls Pizzle – Nomows mook ais ow que
M – The Ouch – See pee tee tuck coon

These are remarkable & high places at the mountains that the Indians fancy has the same appearance as the names given

From A to M 33 Days walk for young men no Blue Head has been there. only a chance Tall Indian, that has been that great Distance.
The Mountains & the South of the Missesawsy River inclines almost East & between C & G & is considerably lower & not so far range as in Lat 53° & 49°

B & G — 2
C G D — 5
D E F — 3
F D G — 3
G & H — 1
H O M — 1
M & G — 2
G & K — 1
K G L — 5
L & A — 9

Numbr of Nights the Indians are from one place to the other

Source: Public Archives of Manitoba, Hudson's Bay Company Archives, G.1/25

FIGURE 3

east are shown, and are well placed in relation to the Rocky Mountain Front and the drainage network of the Plains.

In contrast to his depiction of the Plains, Ak ko mok ki's rendition of the much greater expanse of country that lies between the Rockies and the Pacific affords little in the way of detail and is severely reduced in scale. Whether this was simply a matter of choice on his part, or reflected a more limited knowledge of this complex region, cannot be established with certainty, but the latter seems most likely. Other than the coastline and the eastern limits of the Rockies, the only landscape features shown in this area are the two rivers traversing the country between the Rockies and the sea. The northernmost of these is identified as the Big River, which is most likely the Columbia River, the largest stream draining to the Pacific in this region. The other, which is described as the Red Deers River, is probably the Snake River, which is a south bank tributary of the Columbia. Ak ko mok ki was no doubt aware of the headwater region of the Snake, but on his map he has erroneously drawn it as flowing independently to the Pacific. Although Ak ko mok ki would have known much more about the country to the west of the Rockies than is shown on his map, this confusion, together with the highly schematic manner in which the rivers are drawn, suggest that his knowledge of the region was limited and that this influenced, at least in part, both the detail and scale of his mapping of this area.

Even in the plains area, it is important to note that the map embraces a far greater sweep of country than Ak ko mok ki himself appears to have visited. There are two pieces of information on the map suggesting that this was the case. Fidler has indicated that the distance from A to N on the map, or the full north-south extension of the map along the line of the Rockies, is 33 days walk for young men, further observing that "no Blackfoot has been there, only a chance Fall Indian has been there." Elsewhere on the map he has noted that "these rivers to the South of Mis sis ou ry are Fall Indian names & those to N[orth] are Blackfoot."

These two comments suggest that the Blackfoot, and Ak ko mok ki in particular, were not as familiar with the country to the south of the Missouri as that to the north. At this time, all of the Blackfoot tribes, or the Blood, Piegan and Blackfoot proper, lived and hunted to the north of the Missouri River. This does not mean, however, that Blackfoot Indians did not occasionally journey to the south of the Missouri at this time. Thus, for example, Fidler's earlier journal of exploration indicates that the Piegan, the southernmost of the Blackfoot tribes, travelled considerable distances south of the river on trading, warfare and horse-stealing expeditions. Moreover, the Blackfoot proper were part of a war party which, in the autumn of 1800, travelled south of the Missouri and into the Rocky Mountains in search of their enemies, the Snake Indians. The route taken by this expedition

is shown in Fidler's notebook copy of Ak ko mok ki's map, suggesting that Ak ko mok ki himself had taken part in this campaign.<2> From Ak ko mok ki's depiction of the war track, however, it is apparent that these warriors penetrated no farther south in the plains than the present Musselshell River of Western Montana, or a distance of about seventy-five miles to the south of the Missouri.

The Blackfoot proper, or the Siksika as they called themselves, were the most northerly of the Blackfoot tribes and, for this reason, were probably not as familiar with the country to the south as were the Blood and especially the Piegan. Fidler, moreover, tells us that none of the Blackfoot tribes had ever travelled to the southernmost regions shown on Ak ko mok ki's map. Only the occasional Fall Indian, he remarked, had ever ventured that far. It would appear, then, that despite some familiarity with the lands to the south of the Missouri, the Blackfoot were not as far ranging into this region as were the Fall Indians. Moreover, Ak ko mok ki identified the rivers to the south of the Missouri by their Fall Indian names, and it would thus be reasonable to assume that much of his knowledge of this country was communicated to him by the Fall Indians. The Fall Indians were also known to the fur traders as the Gros Ventres or Big Bellies; their name for themselves was Atsina. They bordered upon the Blackfoot to the south and east and, at this time, were conducting a middleman trade with the more remote plains peoples to the south such as the Arapahoe. It is interesting to note that the Ak ko mok ki map is one of the few historical documents that records the Atsina language, which is preserved in the names of the south bank tributaries of the Missouri communicated to Fidler by Ak ko mok ki.

All of these circumstances point to an ability in Indian map-making that has not been generally recognized. Indian maps have usually been described as cognitive maps based upon personal observation and travel. In this case, it is apparent that Ak ko mok ki was capable of mapping large areas of which he had no experience and in which he had not travelled. The information in this instance derived from knowledge communicated to him by neighbouring Atsina Indians, probably using maps as well as verbal descriptions. Ak ko mok ki was able to take this information and to integrate it into his own perceptual framework derived from observation to produce the map that Fidler copied.

Among its other attributes, Ak ko mok ki's map must be considered one of the most impressive surviving examples of a general or area map constructed by North American Indians. His depiction of the plains region testifies to an outstanding ability to represent, not just the features that establish the spatial sequence of a route, but the basic geographical organization of an entire landscape, with each identifying component being placed in its proper relative position within the whole. This is an exceptional feat, considering that the map depicts more than

300,000 square miles of plains environment, and that only the main identifying features of the landscape have been abstracted from all others to achieve a fundamental, rational ordering of the geography of the region. It is all the more amazing considering that the entire map was sketched out from memory in a manner that successfully integrated information from his own travels with that communicated to him by other Indians of areas he had not seen.

In addition to portraying the main hydrographic framework of the region and its most remarkable topographic features, the Ak ko mok ki map also identifies the different native peoples inhabiting this huge area and provides a census of their numbers. It thus shows the locations of over thirty different Indian nations as perceived by the Blackfoot and Atsina Indians at this time. Estimates of the populations of almost all these peoples are given in terms of the number of tents or lodges comprising each group. Of the thirty-one different peoples identified, only two had visited the Hudson's Bay Company's trading posts by this time.

Finally, the Ak ko mok ki map highlights the importance of the Indian in expediting European exploration, mapping and geographical expansion on the continent. Drawn for Fidler in February of 1801, it was not despatched to England until the summer of 1802. Together with Fidler's report and other Indian maps, it arrived in London on the Hudson's Bay Company's ship *King George* on 23 October 1802. Shortly thereafter it was in the hands of the London cartographer, Aaron Arrowsmith. On December 17th, the Hudson's Bay Company's secretary wrote to both the Admirality and the Royal Society informing them that the Arrowsmith firm considered the Indian maps sent by Fidler "as important in ascertaining, with some degree of certainty, the sources of the the Missisoury." He also observed that they "convey much curious information respecting the face of many countries unknown to Europeans."(3)

The information on the Ak ko mok ki map enabled Arrowsmith to publish for the first time a map containing the outline of the Missouri drainage system. This information appeared almost immediately on the 1802 edition of his map of British North America. This feature of the map was of more than academic interest in America, and was no doubt examined with great care by the American President, Thomas Jefferson, and his Secretary of State, Albert Gallatin. Both of these men had long regarded the Missouri River as a potential pathway to American empire in the Pacific Northwest, but virtually nothing was known of the course of the river beyond its Big Bend in present North Dakota. Its portrayal for the first time on the 1802 Arrowsmith map was timely indeed, for by 1803 Jefferson had negotiated the Louisiana Purchase. In 1804, he despatched Lewis and Clark on the first government expedition to explore the Louisiana Territory along the line of the Missouri River. Not only did the Ak ko mok ki map help fuel

the American design to expand into the Pacific Northwest, but as conveyed on the 1802 Arrowsmith map, it also afforded the only cartographic guide available to Lewis and Clark when they set out from St. Louis in 1804 to follow the Missouri River to its sources in the Rocky Mountains.

Notes

The author gratefully acknowledges the assistance and advice given to him by Dr. Alan Catchpole, Department of Geography, University of Manitoba, in the course of writing this paper. Acknowledgements are also owing to the Hudson's Bay Company Archives, Provincial Archives of Manitoba, for permission to consult their records and to publish the two Indian maps presented here. It should be pointed out that both maps have been redrafted and re-arranged from the originals for legibility and to fit the format required for publication.

1. David H. Pentland, "Cartographic Concepts of the Northern Algonquians," *The Canadian Cartographer* 12 (1975): 158.

2. For an account of these events, as well as additional information on Ak ko mok ki, see Judith Beattie, "The Indian Maps Recorded by Peter Fidler, 1801-1810" (Paper presented at the 11th International Conference on the History of Cartography, Ottawa, 8-12 July 1985). For a comprehensive analysis and identification of the individual features shown on the Ak ko mok ki map, see D.W. Moodie and Barry Kaye, "The Ak ko mok ki Map," *The Beaver*, Spring 1977: 4-15.

3. Alice M. Johnson (ed.), *Saskatchewan Journals and Correspondence* (London, 1967), pp. 319n-320n.

ASSOCIATION OF CANADIAN MAP LIBRARIES

19TH ANNUAL CONFERENCE

CONSERVATION WORKSHOP

Held by Carol Marley and John Kohler
at the conservation laboratories
of the Provincial Archives of Manitoba

During this workshop we will be looking at, and experimenting with, techniques for conserving maps. Before we actually begin experimenting, it is well to define what we mean by conservation. In the loosest sense, to conserve a map is to keep it from harm, decay or loss. Betty Kidd has already written an excellent article on preventive conservation which is cited in the brief bibliography you have been given. All of you will have undertaken to conserve your maps in this sense, so I shall avoid unnecessary repetition.

It is perhaps more complicated to make the distinction between conserving and restoring maps. Robert Akers, also cited in the bibliography, points out the overlapping nature of conservation and restoration. He cautions against do-it-yourself restoration unless you know what you are doing.

Hopefully after this session, we all will be a bit more aware of what we can do, and what we should not attempt, in conserving our maps. A rule of thumb which I always ask myself is: "Is it reversible?" I do nothing more than can be simply undone. For example, if I stick a map together with rice paper and paste, then the rice paper can be dampened and peeled off at a later date. If a map is encapsulated, then its protective encapsulation can be cut away when necessary.

One of your most common problems will be torn maps. If you feel that you can do nothing other than a quick repair job, it is possible to use a tape like Filmoplast. I would never use it on an antique map because it is not reversible and would, rather, encourage you to think of using some of the techniques you will be shown today as preferable alternatives.

If you will permit, I would now like to go back a few years in time, to when I took over the antique map collection at McGill, to share with you some of my experiences in conserving our maps. One of my earliest recollections was one of real ignorance when it came to sources of information on maps, followed closely by a feeling of shock that I was indeed a map curator, and was therefore in some way responsible for the care of the maps in my keeping. This was a very discouraging realization because the maps printed after 1850, particularly those printed in Canada, were in very poor condition. Maps in books of the same period hadn't fared much better, and the cadastral atlases, which are heavily used, were the worst of all.

This is not to say that no-one had initiated a preventive conservation programme. In fact the maps had been housed in horizontal metal cabinets, arranged in shallow drawers, stored in acid-free folders and interleaved with acid-free paper. Our lights are shielded. Written instructions regarding the handling of materials are provided to our readers and staff.

Unfortunately these very instructions pose conservation problems with respect to the maps. No tracing is allowed. At our university we do not have reprographic equipment which can be used conveniently to copy from microforms. The only way by which a user may obtain an image of a map is to photograph it, or alternatively, photocopy it when condition permits. Unfortunately many of the maps atlases were, and still are, too fragile to be copied.

Our earliest conservation efforts were directed toward the atlases. We were fortunate to receive a small amount of money from the director of libraries, specifically for conservation of the maps. If your director is not as sensitive to your needs, do something about it. Educate him or her. With this money we engaged a conservator to pull apart the cadastral atlases, deacidify and reinforce the paper (when necessary) and store the individual plates in boxes. Pulling apart the atlases was a major decision from a biliographic point of view. However many of the atlases were in binding which could be snapped open to accommodate new sheets, and we decided that we were not therefore compromising the integrity of the atlas too much in pulling it apart. Certainly the decision has proved to be a popular one with our readers, because now several people can work on an atlas simultaneously.

Some time later we began to address the problem of sheet maps, after a library technician asked why the maps were not encapsulated. When queried, our conservator said, "Why not, so long as the encapsulating materials are acid free." He showed me how to encapsulate, and over the summer all of our most used maps were encapsulated; i.e., the maps of Montreal and the Province of Quebec.

The encapsulation process has made it possible to use some of the extremely brittle Canadian government maps, and has pleased our photocopy operator enormously, because the maps can now be handled with some degree of assurance for their well-being.

Somewhat belatedly we had our conservator encapsulate the pages from one of the atlases which proved to be a fairly expensive proposition, but in retrospect, well worth the investment. For other of the atlases, conserved at an earlier date, we simply encapsulated the few sheets at the front which receive the worst wear and tear.

Encapsulating the maps has not, of course, solved all of our problems. It is, quite simply, a holding action. In most cases, the paper has been deacidified. Until this is done the paper will continue to disintegrate. However, the maps will be somewhat protected in the interim, and we can use them until such time as we can afford to better care for them.

Some of our maps were unusable, either because they were curled or they had already disintegrated into many pieces. The former we dampened, weighted and flattened. The latter we stuck back together with rice paper strips and wheat flour paste. These maps were subsequently encapsulated.

These simple techniques have made an enormous difference to the condition of our maps. Should you need a bit more information to get started once back at your own institution, a selected bibliography on map conservation has been provided. Accompanying it is a short list of major conservation supply dealers.

I would urge you to be cautious, but by all means, do something. Something is better than nothing, so long as it is reversible. *(At that point the participants were given the opportunity to run through several techniques used at McGill University so that they could have some hands-on experience.)*

Selective Bibliography on Conservation

Articles appear regularly on conservation in a number of journals. Those journals publishing articles specifically applicable to map conservation are *Special Libraries* and *The Map Collector*.

Particularly useful articles on map conservation are:

Akers, Robert C. "Care and Handling of a Map Collection," *The Map Collector*, no. 4, September 1978, pp. 2-5.

"Cleaning and Restoration of Maps," *The Map Collector*, no. 10, March 1980, pp. 19-23.

"History of Paper-Making," *The Map Collector*, no. 5, December 1978, pp. 11-15.

Kidd, Betty. Preventive Conservation for Map Collections," *Special Libraries*, vol. 71, December 1980, pp. 529-538.

A useful source for up-to-date information on conservation in general is the column in *Art Documentation*, "On Preservation," edited by Susan Schwartzburg, author of the informative monograph, *Preserving Library Materials: A Manual* (Scarecrow Press, 1980). Also useful are the technical bulletins and journal of the *Journal of the Canadian Conservation Institute* in Ottawa. There is an article specifically on maps in the *Journal*, vol. 1, 1976, pp. 27-28.

Many bibliographies exist on conservation and restoration of library materials. A recent and useful one has been compiled by Edward A. Collister for the Ministère de l'Énergie et des Ressources, titled *La Preservation et la Restauration de Documents. Suggestions de Lectures Pratiques = The Preservation and Restoration of Library Materials: A Basic and Practical Reading List*, 2d ed. (Quebec: 1984).

Conservation Supplies Dealers

Charles T. Bainbridge's Sons, (Canada) Limited, 55 Alden Road, Markham, Ont. L3R 3L5, (416) 495-7566, Telex 06-986931.

Canadian distributor for Ademco's Archival Aids. Products include draft clean powder and/or pads, cutting mats, document repair tape, hinging tape, spray aerosol deacidifiers.

Filmolux International Inc., 115 Cleta Drive, Scarborough, Toronto, Ont. M1K 3G8.

Distributes filmoplast tape and laminating supplies.

Hollinger Corporation, P.O. Box 6185, 3810 South Four Mile Run Drive, Arlington, VA 2206, (703) 671-6600.

Supplies document cases, acid free folders, envelopes, interleaving materials.

W.J. Stewart Co., 1970 Ellesmere Road, Unit 11, Scarborough, Ont. M1H 2W1, (416) 438-2991.

Provides Ademco products such as tacking irons, laminating tissue, document repair tape, acid free folders and boxes, encapsulation tools, double-side polyester transparent tape, rolls of polyester plastic for encapsulation, Wei T'o dip tanks and solutions, pH indicator strips.

Talas, Division of Technical Library Service, 130 Fifth Avenue, New York, NY 10011.

Supplies for and handbooks on bookbinding, papermaking and marbling, repair and restoration and calligraphy. Materials for restoration and repair include Japanese papers, acid free papers and envelopes, laminating tissue, Wei T'o supplies, sprayers, chemicals and acid free plastic envelopes.

Facilitator: Carol Marley,
Map Curator
McGill University Libraries

* * *

Following Carol Marley's presentation, John Kohler, Assistant Conservator of the Provincial Archives of Manitoba, demonstrated a number of techniques for conserving materials. He provided instruction sheets for encapsulating maps in mylar, dry cleaning archival documents, minor paper repairs, and mixing wheat-starch paste and methol cellulose adhesive (the latter is recommended because it stores well and introduces less moisture into the paper surface being repaired).

* * *

Workshop participants had the opportunity to practice most of the techniques. For those of our readers who missed the workshop, we are publishing the instruction sheets here. Should you need more information, please contact: Carol Marley, Chairperson of the Conservation Committee.

THE DRY CLEANING OF ARCHIVAL DOCUMENTS

The methods and techniques demonstrated in this workshop are recommended for archival documents only and with the stipulation that the paper is in good condition. Do not use the methods in this workshop to clean the following: fragile paper; charcoal, pastel, chalk, pencil drawings; watercolours; pen and ink drawings; architectural drawings; blueprints; posters; prints.

1. Dry cleaning is the physical removal of surface dirt and accretions which are physically disfiguring and/or may be deleterious to the artifact.

   (i) Dust and Dirt - physically disfiguring and obscure the visual presentation of the artifact.

   (ii) Surface accretions and encrusted dirt - can have an abrasive effect on the paper.

   (iii) Dry dirt - if this becomes moist in conditions of high RH or flooding, it may cause staining (ie. mud). The water or moisture will drive some of the particles further into the paper, whilst dissolving others, carrying them through the paper and depositing them at the edges of the wet areas (ie. causing a tide-mark). These are difficult to remove.

   (iv) Mould spores - present in the air and will settle on exposed surfaces, together with dust and dirt. In the presence of high RH, they will grow, nourished by the size, fillers and cellulose of the paper. Mould not only weakens the paper, but also causes staining which is disfiguring to the artifact and difficult to remove.

   (v) Airborne dirt - ash, soil dust, industrial waste etc. In industrial areas this may be composed of carbon particles, sulphur, tarry material, metallic particles such as iron, copper or lead.

All of these, coupled with atmospheric pollution, such as acid rain, contribute to the deterioration of the paper and must be removed.

These are the only problems I intend to deal with at this stage. However, you may encounter all or some of the following:

1. Wax deposits.
2. Tar.
3. Pressure-sensitive tapes such as Scotch, masking, double-sided.
4. Oil/grease stains.
5. Ink - Printing, iron gall, carbon, ballpoint, felt tip pen.
6. Pencil.
7. Crayon.
8. Adhesive residues - Starch paste, hide glue, contact adhesive.
9. Dry mounting tissue.
10. Deposits of paper or board.

2. Materials

(a) BRUSHES - SOFT brushes can be used as an alternative means of light dusting or for applying dry cleaning powders. They should be about 3" wide.
STIFF brushes can be used for more stubborn dirt that has become encrusted, such as mud, but they should only be used if the paper is strong enough, since if it is soft, the bristles may damage the surface.
PHOTOGRAPHIC BLOWER brushes can be used as another means of removing surface dirt by removing the brush section and using the blower part to blow the dirt away.

(b) DRY CLEANING POWDERS - 'Skum-X', 'Dandy Rub' etc. These are granulated rubber powders which can be sprinkled on to the surface of the artifact and circulated with your fingers.

(c) ERASERS - Magic Rub; Magic Rub Peel-Off (pencil type)

3. Practical application of materials

(a) Powders - can all be used in conjunction with one another, working with a circular motion. NEVER SCRUB!

(b) Brushes - light strokes are all that are necessary, brushing towards the edge.

(c) Erasers - Smooth even strokes in one direction only - NOT BACK AND FORTH,

4. General Hints

1. Ensure your hands are clean before handling the artifact. Natural oils and sweat will be transferred to the area where it has been handled causing possible staining, discolouration and providing a surface to which dirt will be attracted.

2. Always place the artifact on a support such as blotting paper or 'Permalife' paper before beginning treatment.

3. If there are any tears, insert a small piece of blotting paper between the edges to support and protect them.

4. If there are any adhesive or pressure sensitive tapes present, mask them off with a piece of blotting paper. During the dry cleaning process dirt will accumulate on the edges of the tape and when it is finally removed, will leave a dirty mark.

5. Always work systematically around the artifact, working outwards towards the edge. If you do not, you may tear the paper and/or create an uneven appearance.

6. Never rub too hard. Remember, you can always repeat the action. Rubbing too hard may cause 'skinning' (thinning) of the paper.

7. Place weights around the artifact to prevent it from moving whilst you are dry cleaning. The friction created by the artifact rubbing against its support could cause damage to the surface.

8. Never place your hand directly on the surface of the artifact. Place a piece of blotting paper between it and your hand. Sweat and natural oils secreted by the skin could transfer to the artifact and make it difficult to remove.

9. Take extra care where there are pencil signatures or other inscription. Remove nothing unless instructed to do so by an authorized person. IF IN DOUBT - LEAVE IT!

10. Examine the paper and try to evaluate its physical condition. This may be readily apparent. If it is brittle, then more care must be exercised. Do not become too complacent about an apparently strong, durable paper - it may surprise you! Points to watch for:

(a) Embrittlement.
(b) Tears.
(c) Holes.
(d) Soft, almost pulpy texture.
(e) Surface gloss. I.e. heavily-coated magazine type paper, since these cannot be dry cleaned.
(f) Thickness.
(g) Western or Oriental? Erasers will easily abrade Oriental papers.

Wheat Starch Paste

440 ml water
50 gms wheat starch
250 ml water

Bring 440 ml water to boil. Mix starch with 250 ml cold water. Add slowly to boiling water stirring. Turn down heat to low or simmer and cook until thickened (about 20 minutes). More water can be added for thin paste while mixture is cooking. Paste should be cooked in Corning Ware type pot not in aluminum or iron. Allow to cool to room temperature and then place in fridge for several hours before using.

Methyl Cellulose adhesive

$3\frac{1}{2}$ gms/100 ml water (3.5% solution)

Pour water in a clean glass jar. While stirring, gradually sprinkle in M.C. until the particles are evenly suspended in the water. Cover the jar and let sit until M.C. has completely dissolved and solution is clear. Stir again before use. More water can be added later to thin down the adhesive.

Dupont mylar type "D", 3M #415 encapulating tape, Methyl Cellulose repair paper and wheat starch paste are available through archival catalogues or from TALAS, 213 West 35th St., N.Y., N.Y., 10001

Reemay is available in Textile shops (wax paper can also be used)

Blotting paper can be found in most art stores or from paper supply houses.

Minor Repairs
These do not require the use of silk and include tears, holes, damaged edges, folds, etc. (Figs. 8-10).

No shape which might catch or reduce the flexibility of the repaired document should be used (Fig. 11). An exception is made in those cases where writing on one or both sides of the document obliges the filling on one or both sides to follow closely the shape of the damage however angular that may be. In the case of a corner piece or of any isolated repair, the repair must come off the document at a right-angle to the edge of the original.

When damage occurs on a series of original folds, the repair should run the length of the edge as three or four small patches will only produce weaknesses in between (Fig. 12a). Fig. 12b shows a curve extended to cover damage.

Repairs to a centre-fold should, where possible, be on the outside to strengthen and protect it

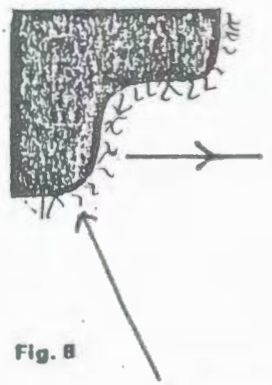


Fig. 8

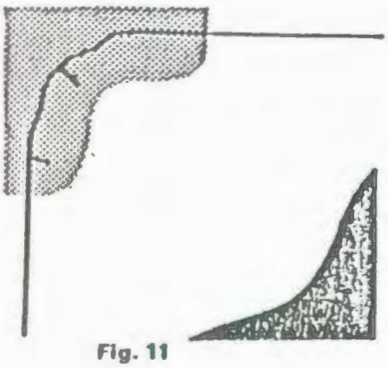


Fig. 11

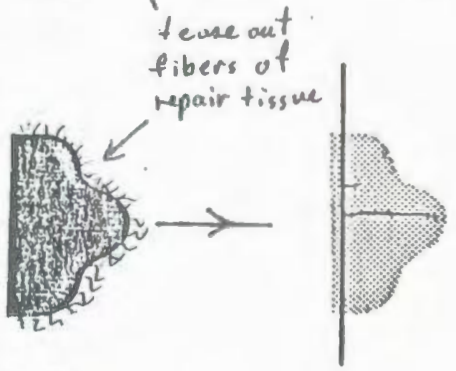


Fig. 9.

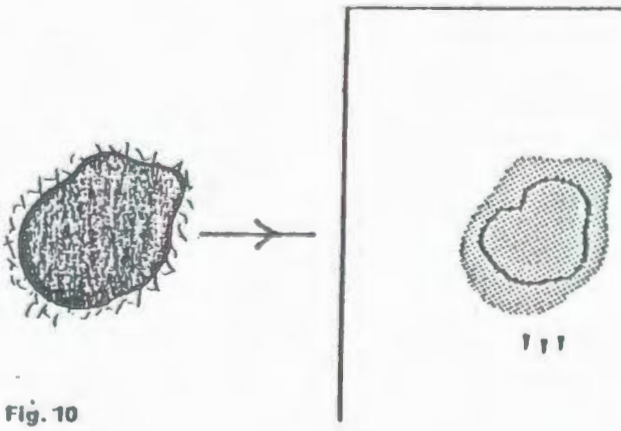


Fig. 10

① needle out repair tissue to fit tear or hole

② tease out fibers of repair tissue

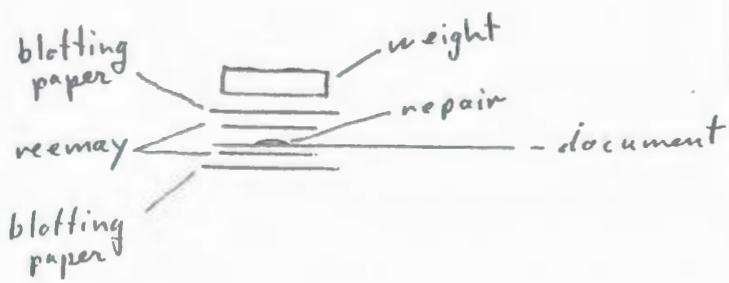
③ Apply as little paste or C.M.C. as necessary to repair tissue

④ Apply repair tissue

⑤ Place reemay back + front of repair

⑥ Place blotting paper back + front

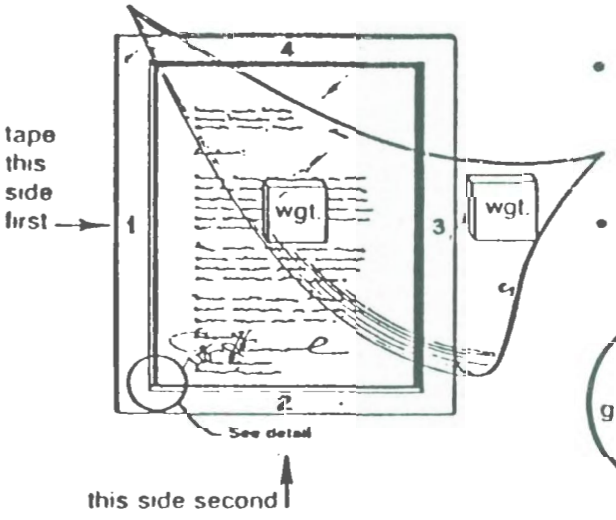
⑦ Apply weight



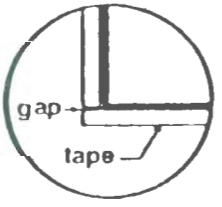
1. Smooth out Grid.
2. Lay paper (document) between polyester film sheets.
3. Square document: Match upper left (top) corner & bottom right corners of document to *inside* of one of the ¾" bands on grid. There will usually be excess polyester around document.

(if paper isn't square, these are the two corners that are important)

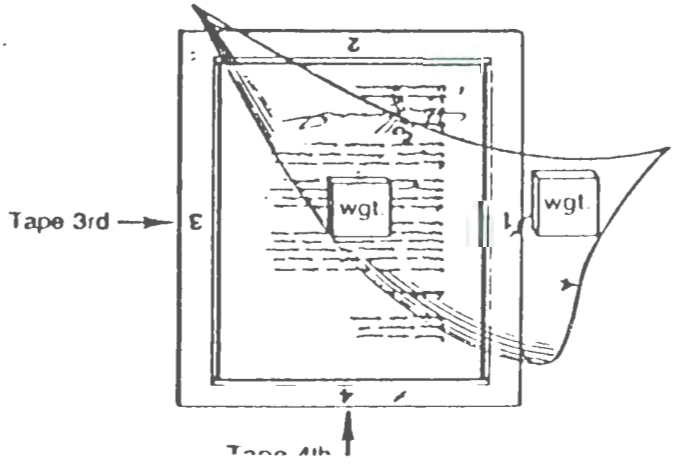
4. Put one heavy weight in the center of document and fold back top piece of polyester — lay 2nd weight on on folded back piece.



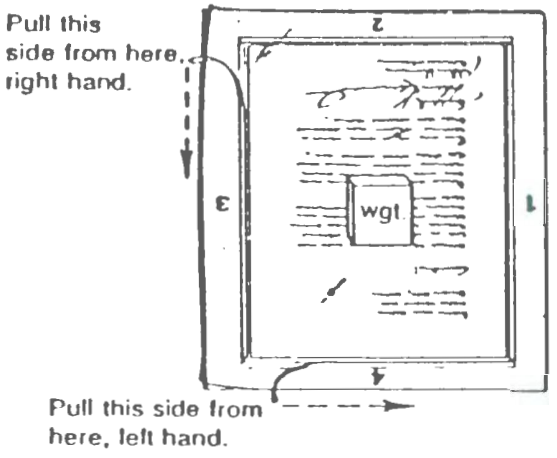
- Pull tape *very* tightly along area to be sealed. (If you don't the polyester will wrinkle.) Match outside edge of tape to outside edge of grid band. There should be a 1/8" gap between document and tape.
- Leave slight gap (1/32" or 1/16") between tape at corners.



5. Turn and tape other two sides

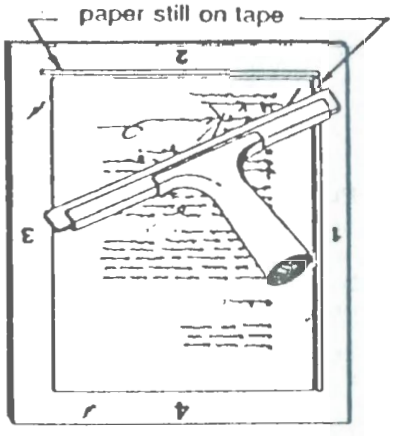


6. Remove 2nd weight, allowing polyester to fall in place. Make sure polyester sheets are evenly aligned. Pull paper off both pieces of tape at the same time, as shown.



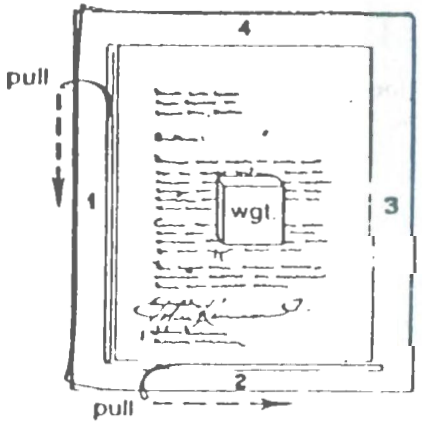
Pull toward yourself as swiftly as possible — very rapid motion.

7.



Pull squeegee (wiper) across top piece of the polyester very quickly 2 or 3 times to smooth out all 3 layers.

8.



Turn material to position shown. Pull two remaining tape paper tops off, again both at once with very rapid pulling motion. (Follow step 6 procedure.)

9. Run wiper across finished product several times to get all excess air out

10. Trim in cutting machine to desired length borders.

11. Cut rounded corners — the polyester is very sharp, and will cut both people and other documents unless corners are rounded.

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ASSOCIATION OF CANADIAN MAP LIBRARIES

Annual Business Meeting

Minutes of Meeting

Winnipeg, Manitoba: 6 June 1985.

1. The 19th Annual Business Meeting of the Association of Canadian Map Libraries was held at the University of Manitoba, St. John's College, Winnipeg, Manitoba, on 6 June 1985. A quorum having been established, the meeting was called to order 1:30 P.M.

2. **Agenda**

   It was **moved** to accept the Agenda as corrected and circulated. (Maureen Wilson, Ronald Whistance-Smith). Carried.

3. **Minutes of the Annual Business Meeting 21 and 22 June, 1984 Fredericton, New Brunswick.**

   It was **moved** to approve the Minutes of the Annual Business Meeting 21 and 22 June, 1984 as corrected and printed in the ACML *Bulletin* 51. (Maureen Wilson, Betty Kidd). Carried.

4. **President's Report**

   The President's Report was distributed with *Bulletin* 54.

5. **Financial Report** (Appendix A, A2, A3, A4)

   The Treasurer reported that the Excess of Receipts over Disbursements for 1984 of $1,041.00 did not reflect the three issues of the *Bulletin* that were published in 1985. These totalled $5,241.00.

   It was **moved** to accept the Auditor's report. (Ronald Whistance-Smith, Cheryl Desjardine). Carried.

It was moved to accept the Interim Treasurer's Report (Velma Parker, Thomas Nagy). Carried.

It was moved that 1985/86 Budget be approved as distributed and amended. (Flora Francis, Alberta Auringer-Wood). Carried.

ii. It was moved that the firm of Deloitte Haskins and Sells be approved as the Association Auditors for the 1985/86 budget year. (Velma Parker, Alberta Auringer-Wood). Carried.

The incoming Board will work on financial forecasting for a few years, in consultation with advice gathered from the Association Auditor.

The incoming Board will investigate the possibility of finding a less expensive Auditing firm for next year's (1986/87) Association audit. The question of the use of a certified General Accountant instead of a Chartered Accountant will be examined.

iii. It was moved that ACML Full and Associate membership fees be increased from $25.00 to $50.00 for 1985/86 and Institutional membership fees from $30.00 to $60.00. (Velma Parker, Thomas Nagy). Defeated.

The Treasurer indicated that should the balance drop to an untenable level, she would tender her resignation.

A summary of the discussion on the proposed and defeated motion on increasing membership fees is included, highlighting the suggestions for the incoming board.

a) Planning for new publication projects should begin in order to increase the Association's revenue for the upcoming years. Conception and printing of a publication and eventual sale of the publication usually involves a 2-3 year period in which little income is collected.

b) A standing order system should be put in place for the Historical Map Series in order to encourage greater sales.

c) The Board should advise the members one year prior to an increase in membership fees in order that the Membership Committee Chairperson amend the membership renewal form.

d) The incoming Board will consult with Lou Sebert regarding application procedures for SSHRC and other granting agencies in order to try to receive funding for the production of the ***Bulletin***.

e) The Board should reduce travel expenses -- have one Board meeting instead of two or use Conference calls for Board meetings.

The incoming Board would like the opinions of the membership on the following question: Should the membership fees cover the expense of the production of the ***Bulletin***? Currently the membership fees are not sufficient to cover the expense of the production of the ***Bulletin***.

It might be desirable for the General Fund in the Budget to be used for sponsoring special projects for administration costs, for example, collection development policy meeting and the membership costs covering the production of the ***Bulletin***.

It was **moved** that there be no increase in membership fees for 1985/86. (Hugh Larimer, Ronald Whistance-Smith). **Carried.**

6. 2nd Vice-President's Report

a) Publications Committee

It was recommended that the report of the Publications Committee be received as read by the Chairman of this Committee.

b) *Early Canadian Topographic Map Series*

It was recommended that the report of the Early Canadian Topographic Maps Series Committee be received as read by the 2nd Vice-President.

c) *Essays on Canadian Cartology*

Aileen Desbarats and Barbara Farrell have agreed to do the editing of the manuscript.

The membership recommended that the incoming Board investigate making this a *festschrift* publication in honour of the late Dr. Nicholson and investigate the possibility of getting grant money to publish it.

d) *Directory of Canadian Map Collections* (5th edition)

It was recommended that the report of the *Directory of Canadian Map Collections* 5th edition be received as printed in *Bulletin* 54.

e) Historical Maps Committee

It was recommended that the report of the Historical Maps Committee be received as printed in *Bulletin* 54.

f) *Bulletin*

The Interim Past President reported that no *Bulletin* Editor has been found to date.

Below are options prepared by the Board and supplemented by the membership.

1. An ACML member volunteers and works with a paid copy editor (includes word processing and preparation for printing).
2. ACML members form an Editorial Committee to work with a paid copy editor.
3. Honorarium of $1,000.00 for four (4) issues of the *Bulletin* be paid to an ACML member who works with a paid copy editor.
4. Non-ACML member paid to be Editor and works with a paid copy editor.
5. Reducing the number of *Bulletins* published in a year.
6. Changing the format to a newsletter.
7. Each Regional Editor is responsible for an issue and they divide up the work amongst the ACML members in their area.

Below is a summary of the steps that will be taken into consideration by the new Board.

i. Ronald Whistance-Smith volunteered to be the *Bulletin* Editor and be paid the Honorarium. The Board will take this offer under consideration and get in contact with Ron.
ii. The Board will send out a special mailing as soon as possible outlining in greater detail the responsibilities of the *Bulletin* Editor and defining the Honorarium option more clearly.
iii. The members who are willing to assist the Regional Editors for the production of an issue of the *Bulletin* in their area as outlined in option 7 will leave their names with the Board following this meeting. This would be an interim solution until a *Bulletin* Editor can be found.

iv. Thomas Nagy and Betty Kidd have tentatively agreed to do the June issue.

Alberta Auringer-Wood, Atlantic Regional Editor, expressed thanks to all ACML members who reviewed books for the *Bulletin*. She mentioned that there are a list of books to be reviewed in *Bulletin* 54.

7. 1st Vice-President's Report

a) Conference Handbook (E. Hamilton, chair)

It was recommened that the report of the Conference Handbook Committee be received as reported.

b) Membership Committee

It was recommended that the report of the Membership Committee be received as printed in *Bulletin* 54, including the verbal report presented by the Chairperson.

The Membership Committee Chairperson asked all members to renew their memberships prior to the Annual Conference and to include their invoice with their cheque when renewing their memberships.

c) Conservation Committee

It was recommended that the report of the Conservation Committee be received as printed and amended in *Bulletin* 54.

d) CCBCCM Committee (Canadian Committee for the Bibliographic Control of Cartographic Materials)

It was recommended that the report of the CCBCCM Committee be received as printed in *Bulletin* 54.

e) Awards Committee

It was recommended the report of the Awards Committee be received as printed and amended in *Bulletin* 54. The Chairperson asked the membership to send her recommendations for members to be given this award for next year.

f) Copyright Committee

There is no Chairperson for this Committee. Carol Marley and Aileen Desbarats will work on a submission on the Paper to be presented to Consumer and Corporate Affairs within the next three months. A once this

legislation is tabled, this Committee will not be able to provide any suggestions for a two-year period when this bill becomes law.

It was recommended that the report of the Copyright Committee be received as made available.

g) Union List of Atlases of the Atlantic Provinces

It was moved that the Union List of Atlases of the Atlantic Provinces be dissolved. (Thomas Nagy, Alberta Auringer-Wood). Carried.

If the need arises, this Committee could be reconstituted.

h) Conference Committee 1985

It was recommended that the report of the Conference Committee 1985 be received as reported.

i) Conference Committee 1986

The Interim Past-President reported that Dr. Ruggles of Queen's University, London, is interested in hosting the 1986 ACML Conference. The Chairpersons for this Committee are Elizabeth Hamilton and Thomas Nagy. It was recommended that the report of the 1986 Conference Committee be received as reported.

j) Map User Advisory Committee

The Chairperson presented a verbal report. There are two additional members -- Karen Young and Lou Sebert. This Committee hopes to prepare a questionnnaire on what information members would like to see on maps. ACML members are asked to send their suggestions for changes to be incorporated in the 2nd edition of ***Canada Gazetteer Atlas*** to this Committee so that it can send your views to Energy, Mines & Resources who are working on the production of the 2nd edition. The Regional Editors should find out what new maps are being published in their area and report on this in the ***Bulletin***.

k) Nominations and Elections Committee

It was recommended that the meeting postpone consideration of this item on the agenda until after the New Business section.

8. New Business

a) Rate differential

It was moved that ACML Full, Associate and Honorary members in good standing receive a rate differential for ACML workshops, conferences and activities for which a fee is levied. (Thomas Nagy, Timothy Ross). Carried.

The Membership Committee Chairperson asked the new Board to amend the membership renewal form, indicating the time period during which the membership fee must be paid

b) Accreditation Report (see Appendix B)

It was moved that the ACML Ad Hoc Committee on Accreditation be approved as amended and the the Committee be dissolved. (Timothy Ross, Lou Sebert). Carried.

9. Other Business

i. Nominations and Elections Committee

The Committee Chairperson announced the acclaimed and elected slate of candidates for 1985/86 as follows: President -- Bob Batchelder; Past-President -- Elizabeth Hamilton; 1st Vice-President -- Brenton MacLeod; 2nd Vice-President -- Aileen Desbarats; Treasurer -- Velma Parker; Secretary -- Cheryl Desjardine.

It was moved that the ballots of the 1985 election of the Association of Canadian Map Libraries be destroyed. (Lorraine Dubreuil, Flora Francis). Carried.

ii. It was moved that the appreciation and thanks of the Association be extended to Timothy Ross, Hugh Larimer and Judith Beattie for the outstanding job done in organizing the 19th Annual Conference of the Association of Canadian Map Libraries. (Ronald Whistance-Smith, Frances Woodward). Carried.

It was moved that the appreciation and thanks of the Association be extended to the Provincial Archives of Manitoba, the University of Manitoba Libraries, St. John's College, Travel Manitoba, Manitoba Surveys and Mapping Branch, and the city of Winnipeg for their support and cooperation in the planning of the 1985 Conference of the Association of Canadian Map Libraries. (Aileen Desbarats, Barbara Zramirowski). Carried.

It was moved to adjourn the 19th Annual Business Meeting. (Alberta Auringer-Wood, Lou Sebert). Carried.

Respectfully submitted,

(sgd.) Karen Young

REVIEWS

Modelski, Andrew M. *Railroad Maps of North America: The First Hundred Years*. Washington: Library of Congress, 1984. 186 pages, illustrations, maps, index. US $28.00. (ISBN 0-8444-0396-2; LC G 1106. P3M6 1984).

The opening of the Baltimore and Ohio in 1830 signalled the successful marriage in North America of the technologies of steam and rail, and launched the continent's obsession with steam trains. A sophisticated technology, requiring minimum curves and grades, the railway demanded careful preliminary surveys and maps. Once completed, the railway had to attract freight and passenger traffic, a need which called for elaborate promotional literature, including maps.

Andrew Modelski has selected from the thousands of railway maps preserved in the Library of Congress ninety-two samples which he believes best exemplify the development of cartographic styles and techniques and illustrate the achievement of North American railways. The maps he has chosen accomplish that purpose elegantly and, at the same time, illuminate the propaganda techniques the railways employed to lure traffic to their lines. A splendid example of the latter genre is F.A. Hornbeck's "Uncle Sam and His Searchlight." Focussed on the Kansas City, Pittsburgh & Gulf Railroad, a brilliant searchlight illuminates the southern states traversed by that railway. The portrayal of a dozen or so railways leading to Kansas City merely punctuates the blatant message that the southern states are potentially the most productive in the Union.

Among the ten Canadian selections are Sandford Fleming's exploratory survey of the Intercolonial in 1864 and the Canadian Pacific Railway in 1874. Several maps describe the railway systems in Canada and Manitoba at various times, while others portray the Grand Trunk and Canadian National networks in 1896 and 1921 respectively. One very useful map untangles the CPR's complex combination of railways and lake steamers in the Kootenay area at the turn of the century, while another details the CPR's connections to the Klondike. The most fascinating Canadian example is a circular map which drapes the entire world around the North Pole at the centre and prominently depicts the CPR's transcontinental railway and its oceanic steamers as a glamorous global tour.

The sole Newfoundland entry is Albert Blackman's detailed map of the Newfoundland Railway, published in 1890. Unfortunately, the routing is drawn in the heavy black, straight lines common at the time. Equally typical of the era is its description of extensive portions of the island's interior as "fine grazing country."

The exaggeration and boosterism, so lavishly displayed, is ***Railroad Maps of North America's*** greatest value. While the rich detail, exquisite design, and sharply focussed illustrations make this book a work to be enjoyed time and time again, the collected maps as a package exemplify an extraordinary, optimistic, growth-oriented culture.

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Taylor, D.R. Fraser (ed.). ***Graphic Communication and Design in Contemporary Cartography.*** Chichester: John Wiley and Sons, 1983. 314 pp., illus., maps, bibliographies, index. (Progress in Contemporary Cartography, Volume 2.) US $59.95. (ISBN 0-471-10316-0; LC 82-2843.)

This book, the second in the series of *Progress in Contemporary Cartography* edited by D.R. Fraser Taylor of Carleton University, represents a major contribution to cartographic literature. The book's twelve chapters give a wide-ranging overview of past, current and possible future research in cartographic design. Some of the opinions expressed by the eleven different authors are dichotomous, but this does not detract from the overall value of the work. The chapters vary from general, philosophical overviews of map design research -- for example, Petchenik's "A map maker's perspective on map design research 1950-1980" -- to more specific research chapters -- for example, Dobson's "Visual information processing, and cartographic communication: The utility of redundant stimulus dimensions." The only chapter which seems slightly out of place in this volume is Chapter Ten by Bertin and Gimeno on "The cartography lesson in the elementary school." This is a major area of current cartographic research, meriting a volume in this series in its own right rather than being limited to one chapter in a book of this nature.

In addition to being series and volume editor, Taylor also contributes two chapters to this volume. Chapter One is a brief

introduction to map design research, both historical and current. In the final chapter, as well as drawing some conclusions, Taylor introduces the influence of computers to map design, in particular videotext systems such as Telidon.

Chapters Two to Five build up the idea of what cartographic design and communication are, how the research may be carried out and how applicable this research may be to practicing cartographers. Salichtchev introduces the theory of cartographic communication, identifies three different types of map use (communicative, operative and cognitive) and discusses the relationship of cartography to other sciences and research fields. Petchenik, in perhaps one of the most important chapters in the book, sets out what is basically a history of modern research cartography in North America, but perhaps more importantly she points out some of the problems inherent in all psychophysical testing and how little many of the results will apply in a practical map design situation. She clearly states "only a map design that violates the most elementary principles of visual perception...will be found to be significantly 'worse' than a design which does not violate these principles."

In Chapter Four, Bertin gives his thoughts on thematic map design. A lot of what Bertin says will appear very familiar to many cartographers, but he quotes and illustrates sufficient bad examples to underline the need for more awareness of correct map design. Castner's first contribution, Chapter Five, gives an excellent overview of the kinds of research being carried out in cartographic design and communication, giving an insight into visual search experimentation and the application of eye-movement recording among other techniques.

The next five chapters are more specific in nature, describing some particular area of research or theoretical application. Castner and Eastman discuss the effects of experience on map reading tasks; Dobson reports on the use of more than the minimum number of classifying variables for a symbol, for example, using both size and value rather than just size to grade point symbols; Knopfli applies communication theory to generalization. The essay by Macioch on the language of cartography touches on an area of great controversy in cartography, and yet another topic meriting more than a short chapter in this book. As noted before, this reviewer feels that the last of these five chapters, by Gimeno and Bertin, is out of place in this volume.

The penultimate chapter, before Taylor's conclusion, sees Judy Olson discuss the future of cartographic research. Olson believes that cartography has come a long way in recent times, with a healthy variety of research having developed and a promising future, with cartography becoming a "well-rounded and mature discipline," a view which, if this book is anything to go by, is clearly well founded.

Despite the slight gaps in the coverage of the topics discussed and the great variety from detailed to generalized essays, Taylor has done a good job in bringing together the work of authors from both North America and Europe, where there are frequently quite differing approaches to map design and cartographic research. Overall, this is a significant contribution to the cartographic literature and must be seen as essential reading for anyone involved in cartographic design research. It is unfortunate that the book is overpriced, as this will limit distribution and exclude it from use as a textbook for advanced coursework, but it is certainly a volume that should be included in any collection on cartography.

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New Publications

Reprinted on the following two pages are several announcements concerning new publications received by the editors of the *Bulletin*. We expect that they will be of interest to our readership.

TO NOVA SCOTIA LIBRARIANS

The Saint Mary's University Geography Department has just published a study which we feel you will wish to order for your library.

The Gaspereau Valley of Kings County, Nova Scotia: A Map Folio with Text by Hugh Millward (Halifax: Saint Mary's University, Atlantic Region Geographical Studies, No. 4, 1985). 40 pages. $8.25 Canadian.

The Gaspereau valley is a microcosm of Nova Scotia, in which many aspects of the physical and human geography of the province are present in miniature. It illustrates many of the processes, problems, and opportunities typical of the entire region, and is therefore useful as a case study.

This folio presents twenty-two maps and diagrams on twelve large-format (11" x 17") plates. Facing each plate is an accompanying text. Topics include the regional setting, topography, drainage, geomorphology, soils, land holdings, land use, village plans, economic activity, and population. These topics are sequenced to allow an understanding of the relationships between the physical environment and human activity.

The map folio should be of interest to students of physical and settlement geography. It is also a useful addition to collections on Atlantic Canada studies, and residents of the Kings County area should find the volume of particular interest.

Below: extract from the land use map:

TO ORDER: The price is $8.25 per copy. Send orders to the Secretary, Geography Department, Saint Mary's University, Halifax, N. S. B3H 3C3. Make cheques payable to "Atlantic Region Geographical Studies, Saint Mary's University."

Cette carte historique de l'Ancienne Acadie (Aujourd'hui la Nouvelle-Ecosse, le Nouveau Brunswick et l'Ile du Prince-Edouard), superbement illustrée à la manière des cartes du 18e siècle, présente l'Acadie vers 1755 - ses villes et lieux de peuplements importants, ses rivières, ainsi que d'autres éléments topographiques. Une liste des noms anciens et actuels se trouve en marge de la carte.

* *Une carte couleur imprimée sur papier de qualité*
* *Dimension: 56,5cm x 91,5cm (23" x 36")*
* *Echelle: 1: 1 100 000*
* *Conception et réalisation: V. Tico-Thibault*
* *Illustration: Anne Beauchemin*
* *Dépôt légal: BNQ, 4e trimestre 1984*
* *ISBN: 2-89000-151-1*

Coût:

7,95$ + les frais d'expédition de 2,00$ (les résidents du Québec doivent ajouter la taxe de vente de 9%)

Commandes postales:

Productions 'Sources d'Acadie' enr
2206 chemin du Foulon
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06/85

NEWS AND COMMENTS

The Map and Geography Round Table of the American Library Association recently announced the following:

> The Map and Geography Round Table of the American Library Association presented its Honors Award to Gary W. North, Associate Chief of the U.S. Geological Survey National Mapping Program for his "outstanding contributions to map librarianship and to the Round Table."
>
> Mr. North initiated cooperation between map librarians and USGS and continues to support and encourage it. He also convinced the National Cartographic Information Center that map libraries are vital components of their public service program and initiated cooperation between the USGS and GPO depository systems.

For further information contact:

James A. Coombs
Chair
Honors Award Committee
Map and Geography Round Table, 1984-85

care of:

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