

4 • Maps, Mapmaking, and Map Use by Native North Americans

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Even when “map” is defined as broadly as in this volume, evidence for the existence of maps in the native Indian, Inuit, and Aleut cultures of North America is scattered, uneven, and plagued with problems of interpretation. In addition, since all cultures are in a constant state of change, it is not always possible to draw hard and fast boundaries between “Indian” and “European” cartographies or to ascertain what is truly “traditional,” “indigenous,” or “original.”¹ This problem is shared with other chapters in this volume, but it is clearly not one that has prevented us from attempting to describe Native American ways of representing worlds and landscapes in a worldwide history of cartography. This approach springs from the conviction that such stocktaking is necessary if we are to compare how cultures deal with a fundamental human problem—relating themselves to their milieu and to the cosmos.

PRECONTACT, CONTACT, AND POSTCONTACT MAPS

Despite these difficulties, it is possible to recognize three broad categories of Amerindian cartography, all associated with the concept of contact with Europeans and Euro-Americans. The first stage, precontact, predates even indirect European influence and is rooted in antiquity. Evidence of maps that were made largely independent of European influence, however slender, consists of rock art and man-made structures such as mounds, representing mainly celestial and cosmographical subjects. The second stage, comprising maps made at the time of first contact with explorers, traders, soldiers, missionaries, and early settlers for a variety of exploratory, economic, and political negotiations, dates from the mid-sixteenth century to the late nineteenth, depending on region. The main sources of evidence for such maps are accounts of ephemeral maps in early literature on discovery and exploration and very few surviving artifacts on birchbark, skin, bone, and wampum. The third stage dates from the establishment of the first permanent Euro-American settlements, the development of regular trade and communications networks, and the beginnings of resource exploitation. In this category we find Indian maps made to

aid communication with Euro-Americans and to satisfy their requests for information about routes, strategic relationships, and resource locations. They are the most numerous and consist mainly of terrestrial maps drawn on paper in various states of acculturation ranging from entirely native drawn, annotated originals, transcripts made

The work this chapter is based on was carried out over approximately twenty years, during which I have been helped by hundreds of individuals. I acknowledge those who in retrospect I consider to have influenced me most or provided the greatest assistance. Twenty years ago, Herman Friis and David Woodward persuaded me to take seriously my incipient interest in the maps of native North Americans. David went one stage further and helped me begin implementing that advice. At that time I also received invaluable help and encouragement from three other historians of cartography, Louis De Vorse, Richard Ruggles, and Norman Throter. Many individuals in innumerable institutions helped in my searches. Of these Ed Dahl, Robert Karrow, and Charles Martijn were not only responsive to my requests but spontaneous in repeatedly bringing items to my attention. Francis Jennings and Helen Hornbeck Tanner gave me valuable advice during my several visits to the Newberry Library, Chicago. Roy Macdonald, Ojibwa chief of the Whitedog Reserve, Ontario, first made me aware of the ways traditional myth so often infuses topographic reality. In recent years I have been much influenced by contacts with several relative “newcomers” to the field, in particular Barbara Belyea, Margaret Pearce, Robert Rundstrom, and Gregory Waselkov. In the incipient stages of research I was greatly assisted in Sheffield by my then research assistant, Margaret Wilkes; likewise toward the end by Jim McNeil, who carefully systematized and further researched my records. My wife, Margaret, provided invaluable secretarial assistance and independent perspective. To each of these individuals I extend my sincere thanks.

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1. J. C. H. King, “Tradition in Native American Art,” in *The Arts of the North American Indian: Native Traditions in Evolution*, ed. Edwin L. Wade (New York: Hudson Hills Press, 1986), 64–92, esp. 65.

by the solicitors of information, and published engraved versions.

In all these cases, it is important to remember that it was not always the map artifact itself that was the object of curiosity or significance; usually it was the process by which the artifact was made. One of the earliest described examples was the cosmographical map of 1607 observed by John Smith, showing the southern Algonquian world, a circumambient ocean, Smith's land somewhere in that ocean, and the supposed edge of the world (see figs. 4.11 and 4.12). Although the end product was modeled on the earth floor of a longhouse and may have survived only a few hours or days, much of the information content was incorporated in the performance of a three-day ceremony. In another less well known example—in this case entirely gestural—a Micmac chief brought the tips of his thumb and forefinger close together to form a nearly complete circle, then identified the joints along the circle as Quebec, Montreal, New York, Boston, and Halifax (fig. 4.10 below). The small space between forefinger and thumb signified the imminent surrounding of his band.

Ideally, the history of traditional cartography in North America would draw mainly on precontact and contact evidence. Regrettably, the problems of dating and verifying precontact evidence, the paucity of extant examples, and the ambiguity of many textual accounts necessitate the cautious use of postcontact maps that appear to be indigenous. It is difficult to determine how extant examples and historical accounts might relate to precontact maps, but they may give us a window on earlier practices. The incorporation of elements of Indian spatial information, in various forms, into maps made by Europeans is not central to this volume, but it too may provide insight into Native American mapmaking.²

NATIVE WORDS FOR “MAP”

As is the case with other indigenous societies, it is very unlikely that Indian and Inuit languages contained a verb or noun equivalent to “map” before the arrival of Europeans. Indigenous maps were based on different assumptions than European maps and created for different functions. They were born of experience and oral tradition, not an inscribed archival history in the Western sense. Word lists and dictionaries of Indian languages compiled after contact tended, at least until recently, to be unrepresentative of complete vocabularies, omitting many words that were not important in the contexts of Indian-European discourse. Conversely, Indian languages developed new words for embracing European categories. For example, a modern dictionary of Cheyenne gives *ho'evà-ho'xe'èstóo'o* for “map”; its root meaning is made up of the nouns for “land” and “paper.”³ Whereas land is undoubtedly a native concept, paper

(and the closely associated words for “book” and “letter”) is certainly not. Nevertheless, leaving aside complex etymological issues, there are major differences between language groups in the incidence of nouns for “map.” In a sample of ninety-one Indian-English and French dictionaries, twenty-four (26 percent) contained entries for map, but the frequency varied significantly between language groups: Siouan 100 percent, Na-Dene and Algic 35 percent each, Iroquoian 18 percent, and Uto-Aztecan 14 percent. In a total of twenty-four Caddoan, Salishan, and Penutian language group dictionaries there were no incidences of “map.” Half of the Eskimo/Inuit dictionaries had entries for “map.” Some of these differences between language groups are statistically significant, but the reasons are unclear. They probably reflect such variables as the period of first contact with Europeans, the social and economic nature of the postcontact encounter, the period and purpose of dictionary compilation, and the background of the compiler.

Probably long before the arrival of the first Europeans, pictography was a continentwide mode of communication.⁴ But Indian discourse did incorporate what, with ref-

2. On this subject, see the following articles by G. Malcolm Lewis: “Indicators of Unacknowledged Assimilations from Amerindian Maps on Euro-American Maps of North America: Some General Principles Arising from a Study of La Vérendrye's Composite Map, 1728–29,” *Imago Mundi* 38 (1986): 9–34; “Misinterpretation of Amerindian Information as a Source of Error on Euro-American Maps,” *Annals of the Association of American Geographers* 77 (1987): 542–63; “Indian Maps: Their Place in the History of Plains Cartography,” in *Mapping the North American Plains: Essays in the History of Cartography*, ed. Frederick C. Luebke, Frances W. Kaye, and Gary E. Moulton (Norman: University of Oklahoma Press, 1987), 63–80; “La Grande Rivière et Fleuve de l'Ouest/The Realities and Reasons behind a Major Mistake in the 18th-Century Geography of North America,” *Cartographica* 28, no. 1 (1991): 54–87; and “Metrics, Geometries, Signs, and Language: Sources of Cartographic Miscommunication between Native and Euro-American Cultures in North America,” in *Introducing Cultural and Social Cartography*, comp. and ed. Robert A. Rundstrom, Monograph 44, *Cartographica* 30, no. 1 (1993): 98–106 (translated as “Communiquer l'espace: Malentendus dans la transmission d'information cartographique en Amérique du Nord,” in *Transferts culturels et métissages Amérique/Europe, XVI^e–XX^e siècle*, ed. Laurier Turgeon, Denis Delâge, and Réal Ouellet [Sainte-Foy, Quebec: Presses de l'Université Laval, 1996], 357–75). See also D. Wayne Moodie, “The Role of the Indian in the European Exploration and Mapping of Canada,” *Zeitschrift für Kanada-Studien* 26 (1994): 79–93; Barbara Belyea, “Inland Journeys, Native Maps,” *Cartographica* 33, no. 2 (1996): 1–16 (this will also appear as chapter 6 in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis [Chicago: University of Chicago Press, 1998]); and idem, “Mapping the Marias,” forthcoming.

3. Northern Cheyenne Language and Culture Center Title VII ESEA Bilingual Education Program, *English-Cheyenne Student Dictionary* (Lame Deer, Mont., 1976), 66, 61, and 78.

4. See Garrick Mallery, “Pictographs of the North American Indians: A Preliminary Paper,” in *Fourth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1882–'83* (Washington, D.C.: United States Government Printing Office, 1886),

erence to a quite different culture and period, has recently been referred to as “non-cartographic structurings of space.”⁵ These almost certainly involved the use of landmarks and routes as references, but in the absence of authentic contact texts, we cannot be certain how. What is certain is that all Indian languages had grammatical and syntactic features enabling a speaker to refer to the locational characteristics of the situation in which a discourse took place.⁶ These features were the linguistic equivalents of spatially structured pictographs.

THE IMPORTANCE OF COSMOGRAPHY

Native American spatial representations of the cosmos are set in a web of spiritual meanings that are carried over into everyday life.⁷ The Oglala Sioux believe the circle is sacred because everything in nature (the sun, sky, earth, moon) except stone is round, and “stone is the implement of destruction.” The circle also defines the edge of the world and the origin of the four winds. Consequently it is also the symbol of the year and of the divisions of time. Carried over into day-to-day life, the circle is employed for the Oglala Sioux tipi, camp circle, and ceremonial arrangement.⁸ Sometimes the circle was an organizational concept to demonstrate the importance of the central homeland. The early nineteenth-century Crow chief Arrapooash contrasted the virtues of his people’s traditional territory in the Yellowstone Valley with the deterioration in conditions that occurred as one moved away from it: to the south, barren plains, bad water, and fever; to the west, bad teeth as a consequence of a fish diet; to the north, long, cold winters and little grass for horses; and to the east, muddy drinking water and confinement to villages.⁹

Peter Nabokov stresses that cosmographical concepts (and their spatial representation) were at the very root of claims and counterclaims of land and property. He uses as an example a Kiowa medicine man named White Bird who, when hearing of complaints from United States commissioners about Kiowa raiding, responded by laying out on the floor two paper circles, one white and one blue. White Bird explained that the white paper represented the earth and the blue paper the sky, with the sun, the Great Father, going around the earth. As a medicine man who controlled the weather (rain) and had access to the “Great Father,” his power rested on firmer moral ground, and he was closer to the Great Father than was the great chief in Washington.¹⁰

Although recognizing that the formulation of a generic American Indian cosmology is a “heuristic conceit,” Nabokov has usefully summarized a number of common traits. The notion of a center, the pivot of sacred geography, is common throughout North America, particularly among the Choctaws of Mississippi, the California

Yuroks, the Pueblos of the Southwest, and the Hopis of Arizona. As one stands in the center and faces the rising sun, the concept of the four directions and the four corners of the universe then becomes woven into the ceremonies and architectural layouts in both Southeast and Plains Indians. The concept of the sky dome or “celestial vault” provides a shelter for this two-dimensional system and is incorporated into the building symbolism of many groups, often with complex astronomical allusions. Linking the sky and the Underworld is the vertical axis, the zenith and the nadir, adding two more directions to the four cardinal ones, plus a seventh—the center on which one stands. All these elements and dimensions were combined into complex “whole cosmologies” depicted by cosmograms and incorporated into dwellings.¹¹ Thus, for example, the Pawnee earth lodge, the Seneca longhouse, or the Navajo male hogan becomes, in a very real sense, a map of the universe.¹²

Although Native American spirituality underlies many of the worldviews, one should not necessarily assume that

4–256, esp. 157–59 (which gives several nineteenth-century cartographic examples), and idem, “Picture-Writing of the American Indians,” in *Tenth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1888–’89* (Washington, D.C.: United States Government Printing Office, 1893), 1–822, esp. 329–57.

5. Kai Brodersen, *Terra Cognita: Studien zur römischen Raumerfassung* (Hildersheim: Georg Olms, 1995), esp. 31.

6. In linguistic theory, “spatial deixis” is the term used to subsume those features of language that refer to the locational characteristics of the situation within which an utterance takes place. It is hence linked cognitively to the egocentric structuring of maps, in which the center is enhanced and the periphery deemphasized. Every North American Indian language family possesses spatial deictic features. Of these, locative suffixes and locative directional markers are virtually universal, associated in a few cases with the use of locative prefixes, prepositions, or postpositions: Joel Sherzer, *An Areal-Typological Study of American Indian Languages North of Mexico* (Amsterdam: North-Holland, 1976).

7. See Peter Nabokov, “Orientations from Their Side: Dimensions of Native American Cartographic Discourse,” in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis (Chicago: University of Chicago Press, 1998), chap. 11.

8. J. R. Walker, “The Sun Dance and Other Ceremonies of the Oglala Division of the Teton Dakota,” *Anthropological Papers of the American Museum of Natural History* 16 (1917): 51–221, esp. 160.

9. James H. Bradley, “Arrapooash,” *Contributions to the Historical Society of Montana* 9 (1923): 299–307, esp. 306–7.

10. Nabokov, “Orientations,” 16 (note 7), from Raymond J. DeMallie, “Touching the Pen: Plains Indian Treaty Councils in Ethnohistorical Perspective,” in *Ethnicity on the Great Plains*, ed. Frederick C. Luebke (Lincoln: University of Nebraska Press, 1980), 38–53, esp. 49.

11. Nabokov, “Orientations,” 15–26.

12. See, for example, Ray A. Williamson and Claire R. Farret, eds., *Earth and Sky: Visions of the Cosmos in Native American Folklore* (Albuquerque: University of New Mexico Press, 1992), esp. Paul Zolbrod, “Cosmos and Poesis in the Seneca Thank-You Prayer,” 23–51, esp. 47–48; Trudy Griffin-Pierce, “The Hooghan and the Stars,” 110–30; Alice B. Kehoe, “Clot-of-Blood,” 207–14, esp. 207–9; and Von Del Chamberlain, “The Chief and His Council: Unity and Authority from the Stars,” 221–35, esp. 226–29.

such spiritual manifestations always reflected a wholly indigenous or traditional Native American culture. For example, the Delaware religious prophet Neolin borrowed a Western idea of the use of the map metaphor for the Christian journeys to heaven and hell—a popular device in nineteenth-century Europe—and adapted it to his own proselytizing. He “made a map of the soul’s progress in this world and the next. . . . [He] traveled from town to town, preaching and holding the map before him while he preached, from time to time pointing with his finger to particular marks and spots on it, and giving explanations.”¹³

Given these layers of meaning, it is no wonder native maps were often misinterpreted by modern scholars. For example, in studying a Skiri (Pawnee) ritual object representing the heavens on tanned animal hide known as the Pawnee star chart (below, plate 7), scholars have spent much time attempting to identify actual constellations. But one must understand that the artifact was intended not primarily as a map of the heavens, but as a mnemonic device for recalling Skiri cosmology during important ceremonies.¹⁴ Since it derived meaning only by being associated with the Big Black Meteoric Star Bundle and the Pawnee earth lodge, the Pawnee star chart must be studied in concert with those items.¹⁵

Rock art might seem to be a potentially rich source of original Native American maps, and some prehistoric art is visually maplike, but here too there are many problems of interpretation. Dating techniques are still being developed, and even where the archaeological record is clear, linking rock art to the culture in which it originated always involves assumptions and speculation. Furthermore, some rock art is polygenetic, with content added by people possessing little or no knowledge of the earlier culture. Since the meaning and function of rock art are not known, what appears from a twentieth-century perspective to have the form of a topologically structured map may well have been made to represent something other than a spatial arrangement. The converse is equally true, and North American rock art may well incorporate as yet unrecognized attempts to “facilitate a spatial understanding of things, concepts, conditions, processes, or events in the human world,”¹⁶ including the mythical and cosmographical.

Since most rock art has been made by cultures no longer living within the region, modern Indians may suggest meaning and function but are almost never able to confirm them authoritatively. Their suggestions are made from modern cultural perspectives and inevitably influenced by Euro-American acculturation. This problem is exemplified by protohistoric structures of the northwestern Great Plains generally known as medicine wheels, typically consisting of a central cairn (or small circle) of stones with radiating stone lines of unequal lengths. The

age and functions of these structures are debatable, but according to a twentieth-century Blackfoot Indian they commemorated the war exploits of great chiefs. He claimed that the stone lines show the direction of each expedition, their lengths indicate the relative distances covered, and the presence or absence of cairns at the end of the lines tells whether any of the enemy were killed. The Blackfoot was reporting the words of his deceased father, who could not possibly have known that in the early eighteenth century Southeast Indians, in making maps on skin for French and English colonial officials, used very similar principles.¹⁷ Even so, his explanation of the function of medicine wheels was only one of several about which there is continuing debate. Not all are cartographic.

ACCESS AND CONSERVATION

Extant “original” maps and contemporary transcripts are spread throughout diverse collections in Europe as well as North America in museums, map libraries, archives, private collections, and government depositories. A significant proportion of original maps probably survives in small collections. These maps, some of which are not even thought of as maps by their custodians, are rarely listed in printed catalogs or separately itemized in collection handlists or card catalogs. In addition, map artifacts have all too frequently been separated from their supporting documents.

Published accounts of mapmaking and printed facsimiles of maps are scattered through an enormous and diverse literature spanning almost five hundred years. This literature is almost never adequately indexed and for the most part is beyond the retrieval capacity of formal search procedures. Many more unpublished accounts and transcripts doubtless exist in equally scattered, difficult to anticipate, often voluminous, and almost always inadequately cataloged archival collections.

13. Anthony F. C. Wallace, *The Death and Rebirth of the Seneca* (New York: Vintage Books, 1972), 119. For a reconstruction of the Delaware prophet’s map, see fig. 4.34.

14. Douglas R. Parks, “Interpreting Pawnee Star Lore: Science or Myth?” *American Indian Culture and Research Journal* 9, no. 1 (1985): 53–65, and Douglas R. Parks and Waldo R. Wedel, “Pawnee Geography: Historical and Sacred,” *Great Plains Quarterly* 5 (1985): 143–76.

15. William Gustav Gartner, “Pawnee Cartography,” unpublished typescript, Department of Geography, University of Wisconsin–Madison, 1992, 40.

16. J. B. Harley and David Woodward, eds., *The History of Cartography* (Chicago: University of Chicago Press, 1987–), 1:xvi (Preface).

17. Thomas F. Kehoe, “Stone ‘Medicine Wheel’ Monuments in the Northern Plains of North America,” in vol. 2 of *Atti del XI Congresso Internazionale degli Americanisti, Roma–Genova, 3–10 Settembre, 1972* (Rome: Tilgher, 1974), 183–89, esp. 184, and Lewis, “Indian Maps,” 64 (note 2).

The issue of public access to sacred Native American maps has been more intense in recent years. An unknown number of maps remain semisecretly in the custody of native people. Others, though in public or private collections, can be consulted and copied only with the permission of the group of origin. For example, although some were published in the 1970s, Ojibwa migration charts are no longer made available for public study, in accordance with Ojibwa wishes. Native American groups are often understandably unwilling to divulge or discuss the meaning of their sacred artifacts and ceremonies. The recent revelation by the Lakotas of some of the principles and practices behind their cosmographical mapping, particularly a nineteenth-century Oglala Sioux's map of the Black Hills, South Dakota, as representing a sacred enclosure, is an important exception.¹⁸

HISTORIOGRAPHY

North American indigenous maps were not systematically studied until the nineteenth century. At that time they began to attract the interest of German scholars such as Alexander von Humboldt and Oscar Peschel (who gave them brief mention in general histories of exploration or works in the history of geography) and Johann Georg Kohl (who in 1857 made what is considered to be one of the earliest references to the importance of Indian maps in museum collections).¹⁹ More substantial was the treatment in Wolfgang Dröber's monograph on the maps of indigenous peoples (1903), and Bruno Adler's seminal and global work on the subject (1910) devoted ten pages to North American examples.²⁰

Very few works in the first half of the twentieth century added to the treatments of Dröber and Adler, but in the 1950s there was some interest in the subject in North America in relation to archaeology.²¹ Since then, and especially after 1970, the topic has received increasing, but still limited, attention from anthropologists, archaeologists, ethnographers, and geographers, often focusing on specific native maps or collections of them and tracing

their influence on Euro-American exploration and mapmaking.²²

A pioneering general contribution was Rainer Vollmar's 1981 monograph *Indianische Karten Nordamerikas*, which consisted of illustrated historical examples arranged chronologically from the sixteenth to the nineteenth century.²³ References to native maps were also

1907), 12; and idem, *Der Charakter der Entdeckung und Eroberung Amerikas durch die Europäer*, 3 vols. (Stuttgart-Götha: F. A. Perthes, 1925–36), 1:159–61.

20. Wolfgang Dröber, *Kartographie bei den Naturvölkern* (1903; reprinted Amsterdam: Meridian, 1964), 63–66 and 69–73, summarized under the same title in *Deutsche Geographische Blätter* 27 (1904): 29–46, esp. 41–44; Bruno F. Adler, "Karty pervobytnykh narodov" (Maps of primitive peoples), *Izvestiya Imperatorskago Obshchestva Lyubiteley Yestestvoznaniya, Antropologii i Etnografii: Trudy Geograficheskago Otdeleniya* (Proceedings of the Imperial Society of the Devotees of National Sciences, Anthropology, and Ethnography: Transactions of the Division of Geography) 119, no. 2 (1910): esp. 64–79 and 161–71; and the abridged translation of Adler's work, H. de Huttorowicz, "Maps of Primitive Peoples," *Bulletin of the American Geographical Society* 43 (1911): 669–79, esp. 671 and 672–73.

21. For example, Delf Norona, "Maps Drawn by Indians in the Virginias," *West Virginia Archeologist* 2 (1950): 12–19; idem, "Maps Drawn by North American Indians," *Bulletin of the Eastern States Archeological Federation* 10 (1951): 6; and Robert Fleming Heizer, "Aboriginal California and Great Basin Cartography," *Report of the California Archaeological Survey* 41 (1958): 1–9.

22. Works on particular maps and groups of maps are cited in the body of this chapter. General works include Louis De Vorse, "Amerindian Contributions to the Mapping of North America: A Preliminary View," *Imago Mundi* 30 (1978): 71–78; idem, "Silent Witnesses: Native American Maps," *Georgia Review* 46 (1992): 709–26; idem, "Native American Maps and World Views in the Age of Encounter," *Map Collector* 58 (1992): 24–29; and G. Malcolm Lewis, "The Indigenous Maps and Mapping of North American Indians," *Map Collector* 9 (1979): 25–32. Also of interest are Kevin Kaufman's introduction to *The Mapping of the Great Lakes in the Seventeenth Century* (Providence: John Carter Brown Library, 1989), 9–11; David H. Pentland, "Cartographic Concepts of the Northern Algonquians," *Canadian Cartographer* 12 (1975): 149–60; Michael Blakemore, "From Way-Finding to Map-Making: The Spatial Information Fields of Aboriginal Peoples," *Progress in Human Geography* 5 (1981): 1–24; and William C. Sturtevant, "The Meanings of Native American Art," in *The Arts of the North American Indian: Native Traditions in Evolution*, ed. Edwin L. Wade (New York: Hudson Hills Press, 1986), 23–44, esp. 37–38.

23. Rainer Vollmar, *Indianische Karten Nordamerikas: Beiträge zur historischen Kartographie von 16. bis zum 19. Jahrhundert* (Berlin: Dietrich Reimer, 1981). See also his "Kartenanfertigung und Raumaufassung nordamerikanischer Indianer," *Geographische Rundschau* 34 (1982): 302–7. For a later but much briefer general review, see G. Malcolm Lewis, "Maps and Mapmaking in Native North America," in *Encyclopaedia of the History of Science, Technology, and Medicine in the Non-Western World*, ed. Helaine Selin (Dordrecht: Kluwer Academic, 1997), 592–94. For major reviews of maps and mapmaking, see G. Malcolm Lewis, "Frontier Encounters in the Field: 1511–1925," "Encounters in Government Bureaus, Archives, Museums, and Libraries: 1782–1911," "Hiatus Leading to a Renewed Encounter," and "Recent and Current Encounters," all in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis (Chicago: University of Chicago Press, 1998), chaps. 1–4.

18. Ronald Goodman, *Lakoña Star Knowledge: Studies in Lakoña Stellar Theology*, 2d ed. (Rosebud, S.D.: Sijte Gleška University, 1992), esp. 9–14.

19. Alexander von Humboldt, *Kritische Untersuchungen über die historische Entwicklung der geographischen Kenntnisse von der Neuen Welt*, 3 vols. (Berlin: Nicolai, 1836–52), 1:297–98; Oscar Peschel, *O. Peschel's Geschichte der Erdkunde bis auf Alexander von Humboldt und Carl Ritter*, ed. Sophus Ruge (Munich: R. Oldenbourg, 1877), 215; and J. G. Kohl, "Substance of a Lecture Delivered at the Smithsonian Institution on a Collection of the Charts and Maps of America," in *Annual Report of the Board of Regents of the Smithsonian Institution . . . 1856* (Washington, D.C., 1857), 93–146, esp. 126. Other early mentions included Richard Andree, "Die Anfänge der Kartographie," *Globus* 31 (1877): 24–27 and 37–43, esp. 25 and 26; Georg M. Frauenstein, "Primitive Map-Making," *Popular Science Monthly* 23 (1883): 682–87, esp. 684–86 (translated from *Das Ausland*); Georg Friederici, *Die Schiffahrt der Indianer* (Stuttgart: Strecker und Schröder,

made in two widely read nonfiction works: a description of a Beaver Indian dream map on moosehide showing the trail to heaven in Hugh Brody's *Maps and Dreams* and reflections on Inuit maps in Barry Lopez's *Arctic Dreams*.²⁴ A cartobibliography has been compiled of pre-1776 Indian and Inuit maps and accounts of mapping activities, and lists have been published of native persons who drafted maps and provided sketches or descriptions of maps for the Hudson's Bay Company.²⁵

In 1992 the five hundredth anniversary of Columbus's landing in the Americas focused attention on the encounter between Europeans and Native American peoples and sparked debates on the meaning of "discovery" and the ethics of European expansion. As a result, interest was aroused in presenting the culture of native peoples at the time of the Columbian encounter, including accounts of Native American wayfinding and mapping. As part of this effort, a major loan exhibition of original Indian and Inuit maps, intended to travel to various sites, was planned by J. B. Harley. Harley's death in December 1991 and logistical problems with the cost and loan policies for the exhibition led to its abandonment.²⁶

Three publishing projects on North American Indian maps have progressed in parallel with this chapter. The first is a large collection of images of Indian and Inuit maps on CD-ROM compiled by the American Geographical Society Collection at the University of Wisconsin-Milwaukee.²⁷ The second, published in 1997, was Mark Warhus's *Another America*, the first book in English on indigenous Native American maps. Warhus reconstructs the situations in which maps were made by Native Americans.²⁸ Third, a series of lectures on North American and Mesoamerican Indian maps and mapmaking was given at the Newberry Library, Chicago, in summer 1993 under the title "Cartographic Encounters." A book containing these essays and several others appeared in 1998.²⁹

The Columbian quincentenary stimulated discussions of the nature of the "encounter" between Europeans and Native Americans, and the difficulties in interpreting information provided in one culture and transmitted to another. Studies carried out in the 1970s and 1980s that interpreted the Indian information assimilated into Western maps tended to evaluate the contributions of native information according to Enlightenment cartographic standards. Barbara Belyea criticized many of these studies for having adopted "the assumptions and standards of European cartography as universal measures of accuracy," translating "Amerindian maps into European terms" and defining "native convention in terms of absence or failure."³⁰ Her views were echoed in a short monograph by Michael Bravo, who pointed out the dilemma in comparing Inuit and Western maps of using the concept of commensurability when it has not been shown that the Inuit employed a general category like scale or accuracy.³¹

24. Hugh Brody, *Maps and Dreams: Indians and the British Columbia Frontier* (London: Jill Norman and Hobhouse, 1981), 266–69, and Barry Holstun Lopez, *Arctic Dreams: Imagination and Desire in a Northern Landscape* (New York: Scribner, 1986), 286–89.

25. I prepared the detailed cartobibliography of forty-two North American Indian and Inuit maps and forty accounts of their maps and mapping from 1511 to 1775, working in the Department of Geography, University of Sheffield, between 1991 and 1993, with a grant from the Economic and Social Research Council; lists of native mappers for the Hudson's Bay Company are appendices 9 and 10 in Richard I. Ruggles, *A Country So Interesting: The Hudson's Bay Company and Two Centuries of Mapping, 1670–1870* (Montreal: McGill-Queen's University Press, 1991), 266.

26. However, an exhibition of facsimiles was mounted soon afterward, "Cartographic Encounters: An Exhibition of Native American Maps from Central Mexico to the Arctic," sixty-two items exhibited in the summer of 1993 at the Newberry Library, Chicago, the captions of which, together with a select bibliography, were published in Mark Warhus, *Cartographic Encounters: An Exhibition of Native American Maps from Central Mexico to the Arctic* (Chicago: Hermon Dunlap Smith Center for the History of Cartography, 1993). Exhibitions incorporating original examples of Indian and Inuit maps included "Taking up the Land: The Mapping of Canada through Four Centuries," summer 1992, Canada House, London, featuring maps from the Hudson's Bay Company Archives, with a twelve-page catalog; "Mapping the Americas," fall 1992, University of Essex Exhibition Gallery, England, featuring five Indian maps, reproduced in Pauline Antrobus et al., *Mapping the Americas* (Colchester: University of Essex, 1992), 61–65; and "J. B. Tyrrell, Explorer and Adventurer: The Geological Survey Years, 1881–1898," 5 April–30 July 1993, Thomas Fisher Rare Book Library, University of Toronto, featuring one Inuit and four Chipewyan maps collected in the Northwest Territories between 1892 and 1894, one of which was reproduced in the exhibit catalog by Katharine Martyn, *J. B. Tyrrell, Explorer and Adventurer: The Geological Survey Years, 1881–1898* (Toronto: University of Toronto Library, 1993), 22. Although not primarily North American in its focus and deliberately selecting items from many cultures and periods, the well-attended and provocative exhibit "The Power of Maps," at the Cooper-Hewitt National Museum of Design, New York, in the winter of 1992–93, contained some items from traditional cultures. Unfortunately, there was no conventional catalog.

27. The *Archive of Native American Maps on CD-ROM* includes brief descriptions and catalog information and was produced in 1993 and 1994 by a team led by Sona Andrews in the Department of Geography at the University of Wisconsin-Milwaukee with a grant from the National Endowment for the Humanities. It is to appear in 1999.

28. Mark Warhus, *Another America: Native American Maps and the History of Our Land* (New York: St. Martin's Press, 1997).

29. The Eleventh Kenneth Nebenzahl, Jr., Lectures in the History of Cartography. The five lectures were G. Malcolm Lewis, "Indian and Inuit Maps: An Introductory Survey" and "The Study of Indian and Inuit Maps: Present and Future"; Elizabeth Hill Boone, "Maps of Territory, History, and Community in Mesoamerica"; Patricia Galloway, "Debriefing Explorers: Amerindian Information in the Shaping of the Delisles' Southeast"; and Peter Nabokov, "Orientations from Their Side: Cosmographies of Native America." The book containing these essays, plus several additional ones, is titled *Cartographic Encounters* (note 2).

30. Barbara Belyea, "Amerindian Maps: The Explorer as Translator," *Journal of Historical Geography* 18 (1992): 267–77, esp. 267.

31. Michael T. Bravo, *The Accuracy of Ethnoscience: A Study of Inuit Cartography and Cross-Cultural Commensurability*, Manchester Papers in Social Anthropology, no. 2 (Manchester: University of Manchester Department of Social Anthropology, 1996).

APPROACH

Several approaches to Native American cartography have been attempted. For example, Vollmar's approach is strictly chronological, with each artifact systematically described in the order of its presumed date. Warhus adopted a broadly historical approach. Both arrangements describe each map according to the period when it was made and trace the circumstances of its creation. The Eleventh Kenneth Nebenzahl, Jr., Lectures in the History of Cartography and the published volume arising from them examined the maps of native North Americans as seen, used, and evaluated contemporaneously and retrospectively by Europeans and Euro-Americans in a range of encounter contexts—among them discovery and exploration, scientific surveys, historical studies using maps in museums and archives, and negotiations for land.³² Another approach could be called “formalist,” in which the broad characteristics of the maps—their media, structure, methods of symbolic representation, and content—could be discussed thematically.

Since the main purpose of this chapter, and this volume, is to focus on the idea of the map as one indicator of ways cultures represent their worlds, and since the physical and historical backdrop of Indian and Inuit groups varies so much over the continent, I adopt here a mainly regional approach followed by a thematic analysis. After a general discussion of maps in rock art, which is a category with its own characteristics and issues, I discuss maps made in the cultures of the Northeast, the Southeast, the Far West, the Great Plains and Canadian Prairies, the Subarctic, and the Arctic.³³ These terms are not intended to define “culture regions” but are convenient geographical categories that have to do in part with material culture, in part with differing landscapes, and in part with historical circumstances of contact with Europeans (see fig. 4.1 for a reference map of North America).

TERRESTRIAL MAPS IN ROCK ART

Like that in other regions of the world, North American rock art contains images that have been interpreted as maps. Verifying these is important because, if authentic, they constitute almost the only cases of purely indigenous cartographic representation. Other media, such as bark, wood, or skin, have simply been too fragile to preserve precontact images. It is convenient to summarize in this separate section the prehistoric rock carvings, paintings, or drawings that appear to be spatial representations of the world or cosmos.³⁴ This section also includes cases of rock art that may have been made during the historic period after contact with Europeans; it is rarely possible to date these accurately. One of the very few examples of a possible prehistoric cartographic image not falling in the category of rock art, the description of the fragments of

an engraved shell cup from Spiro, Oklahoma, dating from the Mississippian period (A.D. 900–1450), appears below, figure 4.42.

Interpreting any form of rock art is fraught with difficulties; determining cartographic content is even more so. Indeed, the very existence of maps in rock art is still in dispute. It is tempting to decide merely from visual correlation that a given image necessarily represents a world referent. But as a caveat, Catherine Delano Smith noted in the first volume of this *History*, “What appears to be spontaneous recognition of a map in fact involves three assumptions: that the artist's intent was indeed to portray the relationship of objects in space; that all the constituent images are contemporaneous in execution; and that they are cartographically appropriate. In the context of prehistoric art, it is difficult to prove that all three conditions are met.”³⁵ In North America there have been numerous “spontaneous recognitions” of maps in rock art, often verging on ill-considered attributions. Attempts to verify these have been negligible. Quite clearly, each claim for a map in rock art must be separately assessed.

The most comprehensive review of North American rock art to date, examining published interpretations before the mid-1970s, includes content under four map-related topics: maps as rock art design, game trails, ground plans of houses or lodges, and astronomical motifs. The author of the review, Klaus Wellmann, offers the following caution:

Largely unsupported is the claim that many rock drawings, especially those of the abstract styles, constitute maps or contour plans of nearby geographic features, or are “locators” pointing to “hidden panels.” It should be noted, however, that maps were sometimes drawn by Indians, and that serious scholars have at times suggested that certain designs in rock art might be so interpreted. Yet, the emphasis is on “might,” and any such explanations remain exceptional and conjectural.”³⁶

32. Vollmar, *Indianische Karten Nordamerikas* (note 23); Warhus, *Another America* (note 28); and Lewis, *Cartographic Encounters* (note 2).

33. I have employed, with modifications, the regional arrangement developed for the Smithsonian Institution's *Handbook of North American Indians*, ed. William C. Sturtevant (Washington, D.C.: Smithsonian Institution, 1978–), and ordered the regions chronologically with respect to earliest European contact (early seventeenth to nineteenth century).

34. “Petroglyph” is here used to mean carving in rock, “pictoglyph” a painted carving, and “pictograph” a painting.

35. Catherine Delano Smith, “Cartography in the Prehistoric Period in the Old World: Europe, the Middle East, and North Africa,” in *The History of Cartography*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1987–), 1:54–101, esp. 61.

36. Klaus F. Wellmann, *A Survey of North American Indian Rock Art* (Graz: Akademische Druck- u. Verlagsanstalt, 1979), 18.



FIG. 4.1. REFERENCE MAP OF NORTH AMERICA. The main map shows the general location of indigenous groups discussed in this chapter. Map details on the following two pages provide additional information on indigenous groups and on place-names. The Siouan-speaking peoples of the northern Great Plains consisted of many divisions and subdivisions. The

Santee or Eastern division, generally referred to as the Dakota, was made up of four subdivisions (Mdewakanton, Wahpeton, Wahpekute, and Sisseton). The Yankton and Yanktonai together formed the middle division or Nakota. The Oglala was one of four subdivisions making up the Teton, also known as the Lakota or Western Sioux.

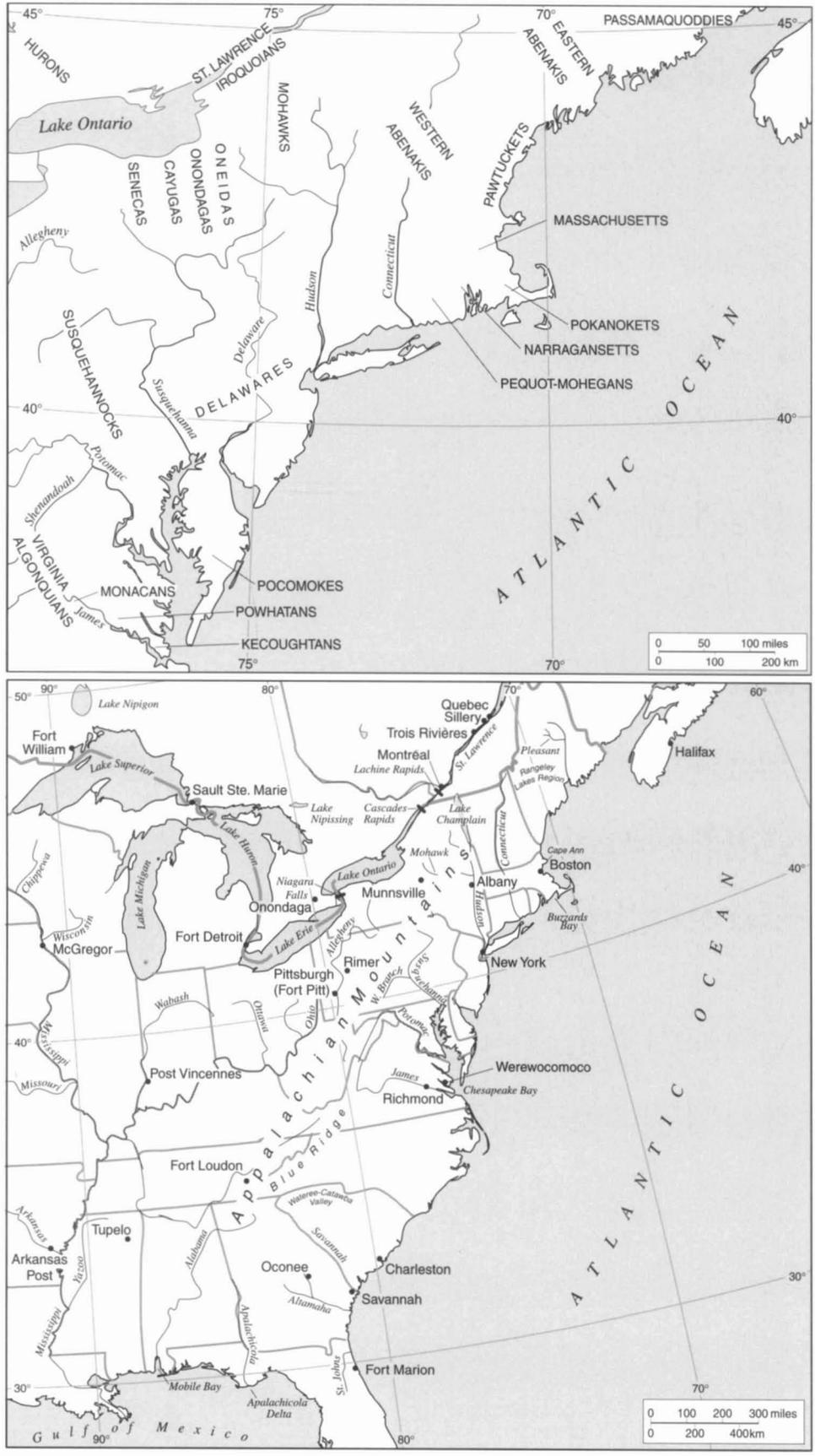


FIG. 4.1. REFERENCE MAP OF NORTH AMERICA (cont.). (Insets 1 and 2)



FIG. 4.1. REFERENCE MAP OF NORTH AMERICA (cont.). (Insets 3 and 4)

With reference to the Great Plains, for example, Wellmann states that “here and there, meandering lines and other abstract elements on certain panels have suggested maps to experienced observers since the designs appeared to correspond rather closely with the features of nearby natural formations such as the contour of a mountain range or the course of a river.” The only cautionary statement was based on the unproven and perhaps dangerous assumption that the unknown artists of the four examples Wellmann cited were culturally akin to postcontact Plains Indians: “It is perhaps pertinent to note here that the specifics of place, such as tipis, villages, hills, rivers and trees do not enter into the Plains Indian paintings on skin, cloth, and paper much before the 1870s.”³⁷

Dating rock art is also a fundamental problem. Although there is a range of recently developed physical and chemical techniques, they have not as yet been widely applied. For example, the probable plan of an animal drive represented in a petroglyph near the Purgatoire River in southeastern Colorado (fig. 4.8, below) has been dated 450 ± 75 years B.P. by the cation-ratio varnish dating technique.³⁸ But no other examples are known.

Evidence of the iconic depiction of mountains has been suggested by a pictograph at Rancho El Tajo in central Baja California, identified as an iconic representation in profile of a nearby skyline (fig. 4.2). Painted in red, an upper line resembles the profile of the mountains of the Sierra de Guadalupe that would have been behind the artist, and a lower, straighter line the foreground profile of the foothills. Although aware that California archaeologists had “rejected theories ascribing cartographic representation to irregular wavy lines or similar forms found in pictograph and petroglyph sites,” Mathes was convinced there was “no question as to the intent of the artist or artists to paint a profile for in no sense can the painting be considered a mere casual wavy line, nor a straight line across an irregular surface, for the surface selected was the smoothest on the rock facing.”³⁹ Mathes’s presentation of the correlation between the rock profiles and skyline is initially convincing, but given the interpretive difficulties, caution is still necessary before coming to positive conclusions.

Another more carefully researched and reasoned example from the north-central Sierra Nevada in eastern California is also likely to leave skeptics unconvinced. It concerns a glyph that has been interpreted as a possible “trail map” linking some seventy-seven petroglyph sites (they fall mostly within 50 m of the supposed trail). It is suggested that a shaman may have incised this glyph for ritualistic use during hunting.⁴⁰

Heizer and Baumhoff, in a review of the prehistoric rock art of Nevada and eastern California, observed that present-day Indians “disclaim knowledge of who made the petroglyphs and are unable to supply meanings of the

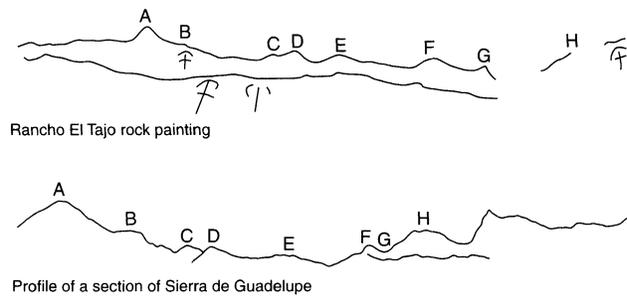


FIG. 4.2. DRAWING OF A ROCK PAINTING IN BAJA CALIFORNIA. This has been interpreted as an iconic representation of a nearby skyline, a claim that is difficult to prove or refute. From Rancho El Tajo in central Baja California. After W. Michael Mathes, “A Cartographic Pictograph Site in Baja California Sur,” *Masterkey for Indian Lore and History* 51 (1977): 23–28, esp. 25 (figs. I and II).

designs.” Yet, although they believe that “the petroglyphs of Nevada are not a form of communicative writing, nor are they maps,” they cited with approval Schroeder’s cartographic interpretation of a petroglyph on the lower Colorado River (fig. 4.4 below).⁴¹ Later, in a detailed study of petroglyph sites in southern Nevada, Heizer in collaboration with Hester tentatively proposed that long ticked lines represented diversion fences for game in plan (fig. 4.3).⁴² Although the lines are not immediately planlike in appearance, they were inferred to represent fences based on environmental and archaeological evidence.

The archaeologist Albert H. Schroeder, then of the United States National Parks Service, interpreted a petroglyph in Arizona as a map of the Colorado River (fig. 4.4). Schroeder, who had been working systematically through the area, described and interpreted the figure, which is part of a complex petroglyph panel on Mohave

37. Wellmann, *North American Indian Rock Art*, 131.

38. Lawrence L. Loendorf, “Cation-Ratio Varnish Dating and Petroglyph Chronology in Southeastern Colorado,” *Antiquity* 65 (1991): 246–55, esp. 249 and 253 (fig. 7). The case for this being a plan of an animal drive is made in Lawrence L. Loendorf and David D. Kuehn, *1989 Rock Art Research Pinon Canyon Maneuver Site, Southeastern Colorado* (Grand Forks: University of North Dakota, Department of Anthropology, 1991), 220–26.

39. W. Michael Mathes, “A Cartographic Pictograph Site in Baja California Sur,” *Masterkey for Indian Lore and History* 51 (1977): 23–28, esp. 23 and 27.

40. Willis A. Gortner, “Evidence for a Prehistoric Petroglyph Trail Map in the Sierra Nevada,” *North American Archaeologist* 9 (1988): 147–54.

41. Robert Fleming Heizer and Martin A. Baumhoff, *Prehistoric Rock Art of Nevada and Eastern California* (Berkeley: University of California Press, 1962), 279 and n. 1 to appendix B on 394.

42. Robert Fleming Heizer and Thomas R. Hester, “Two Petroglyph Sites in Lincoln County, Nevada,” in *Four Rock Art Studies*, ed. C. William Clewlow (Socorro, N.Mex.: Ballena Press, 1978), 1–44, esp. 2–3 and figs. 3a, 4a, and 4b.



FIG. 4.3. PETROGLYPH FROM THE LOWER WHITE RIVER VALLEY, LINCOLN COUNTY, NEVADA. The linear feature across this petroglyph, which is part of a larger composition, has been interpreted as a “drive fence” for animals. From Robert Fleming Heizer and Thomas R. Hester, “Two Petroglyph Sites in Lincoln County, Nevada,” in *Four Rock Art Studies*, ed. C. William Clewlow (Socorro, N.Mex.: Balena Press, 1978), 1–44, esp. 30 (fig. 4b). By permission of Balena Press, Menlo Park, California.

Rock on the east bank of the lower Colorado River, as shown in figure 4.5.⁴³

Evaluating the interpretation in figure 4.5 is not easy and, even if Schroeder’s case is accepted, placing it in its pre-Columbian cultural context is even more difficult. There are so many washes entering the Colorado River near Mohave Rock that it is difficult to identify a specific one as directly opposite or to understand why a particular one should be represented. For this reason Schroeder’s interpretation is unverifiable until the petroglyph is dated and identified with a culture using the Mohave Rock site and the Indian trail crossing the Colorado River at Topock.

A few precontact petroglyphs have been interpreted as maps of very large areas. The most convincing of these purported maps is Map Rock, Idaho, so named by the earliest Euro-American settlers because it looked like a map. It is a massive block of basalt, and on its upper surface and one edge are etched several linear networks and a scatter of zoomorphic, anthropomorphic, and abstract nodes (fig. 4.6). First reported in the *Idaho Statesman* (1889) in an account of an unsuccessful search for diamonds, it was immediately assumed to be “a very fair delineation of the Snake River and its tributaries from the point occupied by the rock to the source of the river in the great Rocky Mountain chain.”⁴⁴ E. T. Perkins Jr. visited it in January 1897 on behalf of John Wesley Powell, director of the United States Bureau of Ethnology, and his report furthered the interpretation of the petroglyph as a map of specific features:

The principal motif seems to be a mapping of the Snake River Valley. The most conspicuous line being the course of the Snake River, and is readily recognizable and quite accurate, compared to the Land Office and other maps. . . . One branch rises from a spring and the other flows from a large lake, the Henry Lake



FIG. 4.4. PART OF A PETROGLYPH PANEL ON MOHAVE ROCK ON THE LOWER COLORADO RIVER, ARIZONA. Of unknown date and culture, the panel can be interpreted as a map of the Colorado River with a transverse Indian trail, itself crossing eight mountain ranges. See figure 4.5. Photograph by Albert H. Schroeder. By permission of Mrs. Ella M. Schroeder, Santa Fe, N.Mex.

of our maps. . . . At the third turn of the stream [Snake River] is a branch from the east . . . which is probably intended for the Black Foot River. . . . The locations of the various groups of circles to the south of the river correspond quite closely to the locations of the ranges of hills which do lie to the south of Snake River.⁴⁵

A speculative interpretation of selected elements suggests it may have been made to represent the drainage, primary watershed, and selected features and characteristics in the middle and upper basins of the adjacent Snake and Salmon Rivers, in what is now southern Idaho (fig. 4.7), an area of some fifty thousand square kilometers.⁴⁶

43. Copy of field notes made at site L:7:3 on 20 February 1951, transcribed by Albert H. Schroeder and communicated to me on 3 December 1979. The originals were deposited at the Lake Mead National Recreation Area but have since been moved.

44. *Idaho Statesman*, 9 October 1889.

45. E. T. Perkins Jr. to J. W. Powell, Washington, D.C., 14 January 1897, National Anthropological Archives, Smithsonian Institution, Washington, D.C., manuscript file 3423a. A later authority developed these ideas further with the suggestion that the zoomorphs represented “faunal features of the Shoshoni region”: Richard P. Erwin, “Indian Rock Writing in Idaho,” in *Twelfth Biennial Report of the Board of Trustees of the State Historical Society of Idaho for the Years 1929–30* (Boise, 1930), 35–111, esp. 109–11. In 1980 Nelle Tobias of McCall, Idaho, supplied me with an undated three-page typescript received “many years” before from J. T. Harrington of Boise, “Aboriginal Map of the Shoshone Habitat.” These interpretations were used in compiling figure 4.7.

46. Other supposed maps of larger areas in rock art are few and extremely contentious. Barry Fell, *Saga America* (New York: Times Books, 1980), 285 and 289, reproduces one petroglyph supposedly depicting the coastal outline of North America and Mexico. Henriette Mertz, *Pale Ink: Two Ancient Records of Chinese Exploration in America*, 2d rev. ed. (Chicago: Swallow Press, 1972), has correlated geographical ac-

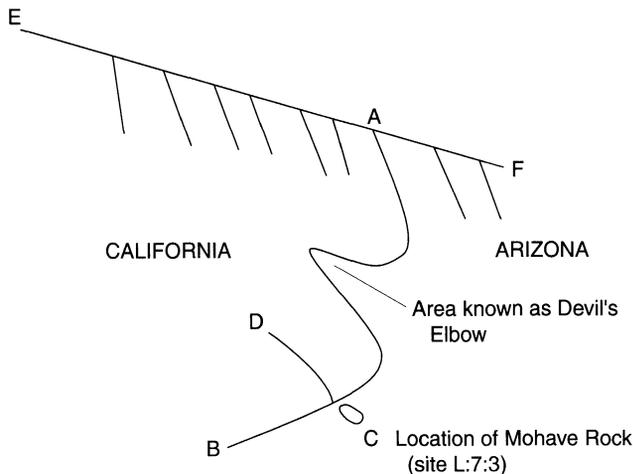


FIG. 4.5. INTERPRETATION OF MOHAVE ROCK PETROGLYPH (FIG. 4.4). According to Albert H. Schroeder, the curves of the long line (A–B) accurately represent the bends of the lower Colorado River between Topock and Mohave Rock, Arizona. The circle portrayed on the petroglyph at C is the locale of the petroglyph site, which was a campsite containing many rock chips and spalls. Unfortunately, a dam built below this area flooded the terrace between Mohave Rock and the river, so any evidence of the extent of this campsite in former times is not known.

The circle is interesting in two respects. It provides the viewer with a point of reference, and it also portrays the shape of the “sleeping circles” found at various campsites throughout the southern California desert. These circles occur in two forms—the desert pavement (small stones that literally cover the desert floor) is raked away from a circular area and piled up in a low mound around its circumference, or a number of rocks are placed in a circle one rock high on the desert floor or pavement that has been cleared. It is thought that brush was held down by these mounds or rocks to act as windbreaks.

The short line D opposite the campsite may well represent the dry wash that comes into the river on the opposite side of the L:7:3. If A is the locale of present-day Topock (judging by the river bends), the line E–F may well portray the known east-west Indian trail that crosses the river at Topock. The two lines on the right, hanging from line E–F, could represent the two north-south ranges (Black Mountains and Hualapai Mountains). Those to the left of the river could represent the north-south Chemehuevi, Sawtooth, Turtle, Old Woman, Ship, and Bullion Mountains in the California desert. (Copy of field notes made on 20 February 1951 and communicated to me on 3 December 1979.)

ROCK ART OF COSMOGRAPHICAL AND CELESTIAL SUBJECTS

Not all worlds supposedly represented in rock art were terrestrial. It seems almost certain that some were shamanistic representations of supernatural worlds made during altered states of consciousness. Landscapes of memory, dream, and trance overlapped the landscapes of the external terrestrial world.⁴⁷ Awareness on the part of the interpreter is all-important. For example, in their

otherwise naturalistic interpretation of the “animal drive” petroglyph near the Purgatoire River, Loendorf and Kuehn suggest that “the bird, protecting the lower end of the net, may represent the power of birds in shaman lore” (fig. 4.8).⁴⁸

The least contentious examples of maps in precontact rock art are spatial representations of celestial assemblages. This is not surprising, for two reasons. First, the patterns of sun, moon, planets, and many stars and nebulae could be directly observed, and they changed in predictable, cyclical ways. Second, the celestial world was the primary concern of many, perhaps most, immediate precontact cultures in North America. In a bold attempt to trace the origins of pre-Columbian art that drew on diverse evidence from Asia, the Pacific Basin, and Australasia as well as the Americas, Terence Grieder recognized three cultural waves. Of these, the third wave was “characterized by a new preoccupation with the celestial realm and the development of orderly systems for understanding and recording its phenomena.” Grieder continues, “The real world was in the heavens where the gods lived. . . . Events on earth took on meaning only by reflection from the heavens.”⁴⁹ More significant in the present context, it is also the tradition in which many celestial rock art panels were made. The greatest and most studied concentration of the latter is in the Southwest, a well-established third wave culture region at the time of first contact.⁵⁰

Since the 1950s there has been accelerating and increasingly scientific interest in the celestial rock art of the

counts in an ancient Chinese book of travels with sites in western North America. She identified Writing Rock, in Divide County, northwest North Dakota, as a marker “carved and left there by those first world map-makers” sent out by the emperor Yu (p. 121). A dominant bird figure on the rock has been seen by most as a thunderbird and thus as indicative of a late prehistoric Indian origin; see Dennis C. Joyes, “The Thunderbird Motif at Writing Rock State Historic Site,” *North Dakota History* 45, no. 2 (1978): 22–25, esp. 25. Working from Mertz’s speculation, Edwin Farnham claimed that the incised bird is an eagle and that, in conjunction with a disk at its tail, it was Yu’s cipher. Furthermore, encoded mainly within the outline of the eagle, he recognizes a map representing the west bank tributaries of the upper Missouri River, with fifty-one incised cups supposedly indicating mountain peaks, lakes, other natural features, and cultural features including medicine wheels; these are within an area bounded by the Illinois drainage system to the southeast, the upper Platte Valley to the south, Vancouver Island to the west, and the Churchill River to the north. E. Farnham, personal communication, 1978–79.

47. David S. Whitley, “Shamanism and Rock Art in Far Western North America,” *Cambridge Archaeological Journal* 2 (1992): 89–113, and David Maclagan, “Inner and Outer Space: Mapping the Psyche,” in *Mapping Invisible Worlds*, ed. Gavin D. Flood (Edinburgh: Edinburgh University Press, 1993), 151–58, esp. fig. 3.

48. Loendorf and Kuehn, 1989 *Rock Art Research*, 226 (note 38).

49. Terence Grieder, *Origins of Pre-Columbian Art* (Austin: University of Texas Press, 1982), 100 and 101.

50. Grieder, *Origins of Pre-Columbian Art*, 16–17 (fig. 1).



FIG. 4.6. MAP ROCK PETROGLYPH, SOUTHWESTERN IDAHO. The block of basalt is at the base of a 150-meter-high cliff 600 meters northeast of Givens Hot Springs, Canyon County, Idaho, on the north side of the Snake River. The "map" face is oriented toward the river and slightly upstream, so that it confronts anyone traveling down the valley. It is a pecked and grooved petroglyph made up of smooth lines,

wavy lines, circles, zoomorphs, anthropomorphs, and abstract figures. Although not provable, this is one of the more convincing examples of a map in rock art (see fig. 4.7).

Size of the rock: $2.2 \times 1.8 \times 1.5$ m. Photograph courtesy of G. Malcolm Lewis. By permission of the Idaho Historical Society, Boise.

Southwest. In 1955 William C. Miller of Mount Wilson and Palomar Observatories published two very similar papers arising from a suggestion made by the English astrophysicist Fred Hoyle.⁵¹ On 4 July 1054 Japanese and Chinese astronomers had independently observed and recorded a supernova near the star ζ Tauri. Because of an explosion, the supernova had suddenly increased so greatly in brightness that it could easily be seen in broad daylight. Theoretically it should also have been visible in southwestern North America. Miller's computations indicated that the moon there at that date was at crescent phase and at one stage was only two degrees from the supernova. Miller suggested that this close and spectacular juxtaposition was recorded in two rock art panels found in northern Arizona. A painting on the wall of a cave at

White Mesa and a glyph on the walls of Chaco Canyon, a tributary of Navajo Canyon, both show a crescent in close association with a circle. In Miller's opinion there is a strong possibility that the two pictographs depict the supernova of 1054.⁵² Later searches revealed that more than fifteen sites spread over western North America included representations of a crescent and a bright object juxtaposed, and according to John C. Brandt, several conditions point to an independent American Indian record-

51. William C. Miller, "Two Possible Astronomical Pictographs Found in Northern Arizona," *Plateau* 27, no. 4 (1955): 6-13, and idem, "Two Prehistoric Drawings of Possible Astronomical Significance," *Astronomical Society of the Pacific Leaflet*, no. 314 (July 1955): 1-8.

52. Miller, "Two Possible Astronomical Pictographs," 9.

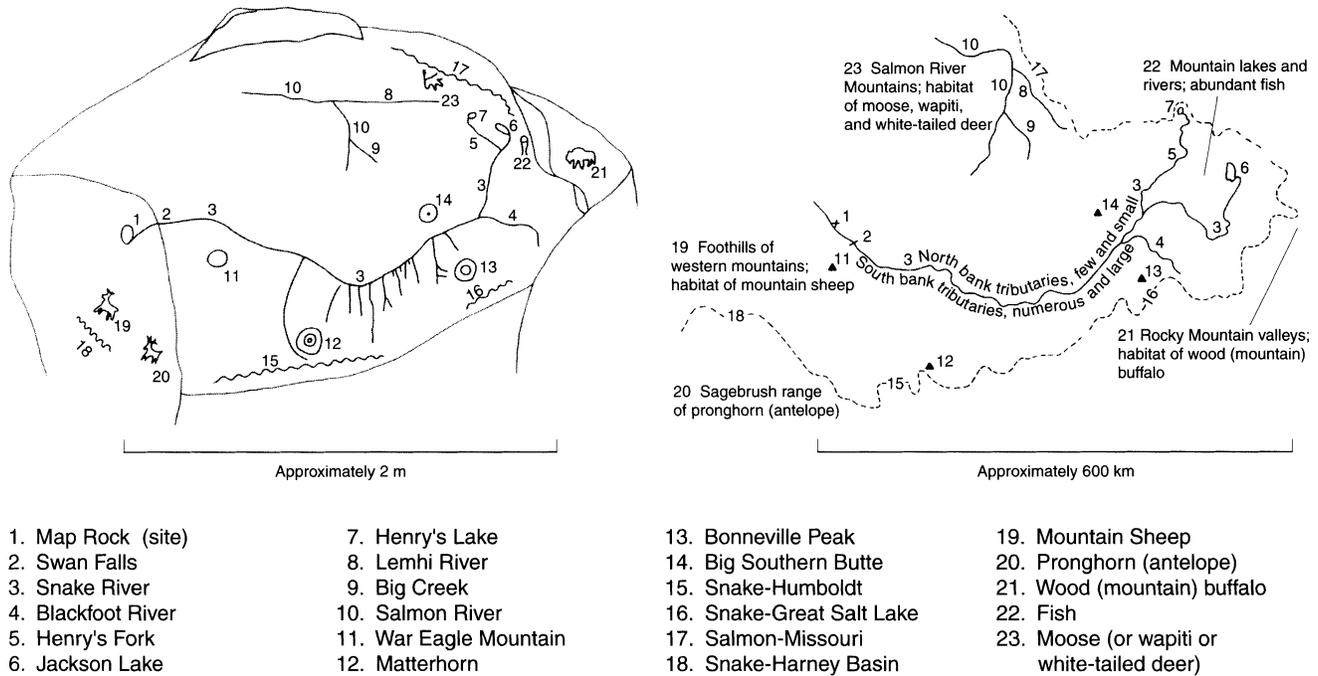


FIG. 4.7. SPECULATIVE INTERPRETATION OF MAP ROCK. On the left is a line drawing of Map Rock (fig. 4.6) delineating and identifying selected features. On the right is a map of the corresponding area, which was occupied by Shoshones in early historical times. The interpretation is based

in part on a letter from E. T. Perkins Jr. (1897) and on a typescript from J. T. Harrington (n.d.); see note 45. Features 2–10 are hydrological, 11–14 are conspicuous peaks, 15–18 are watersheds, and 19–23 are animal figures.

ing of the event: the scarcity of crescents in American Indian rock art; that the close conjunction of moon and supernova was visible only in western North America; and archaeological evidence of eleventh-century habitation near the sites.⁵³

In 1989 Michael Zeilik expressed his opinion that the Chaco Canyon pictograph represents Venus rather than the supernova next to the crescent moon and noted other sites where the line of reasoning interpreting the design as the 1054 supernova seemed questionable.⁵⁴ But even those who dispute that the marks represent the supernova have assumed that they plot some kind of celestial juxtaposition.

More recently, there has been much interest in celestial subjects in both prehistoric and historic rock art of the Southwest, of which a few Navajo examples are discussed here. Astronomer Von Del Chamberlain has recognized several Navajo constellations in a rock art star panel in the Largo Canyon, New Mexico, including the First Slender One (the belt and sword of Orion), the Pleiades, Rabbit Tracks (the tail of Scorpius), and possibly Man with Legs Ajar (Corvus) (fig. 4.9). The star patterns are similar to those found on Navajo gourd rattles used in the Night Chant, sandpaintings, a star chart made by a Navajo singer for Bernard Haile, and the Mask of Black God (which traditionally bears the Pleiades on the left

temple).⁵⁵ The purpose of this representation was clearly ceremonial, to capture the powers of the constellations portrayed.

The purpose of the Navajo star ceilings in the “Four Corners” region of the American Southwest is less clear. There are more than fifty recorded examples of collections of black, red, and white crosses (stars) painted on the undersurfaces of rock-shelters and cliff overhangs. Many of these crosses appear to have been repetitively stamped with tools made of wood, leather, or yucca leaves.⁵⁶ Based on a study of star ceilings in the Canyon de Chelly, northeastern Arizona, Claude Britt speculated that, although

53. John C. Brandt, “Pictographs and Petroglyphs of the Southwest Indians,” in *Astronomy of the Ancients*, ed. Kenneth Brecher and Michael Feirtag (Cambridge: MIT Press, 1979), 25–38, esp. 37.

54. Michael Zeilik, “Keeping the Sacred and Planting Calendar: Archaeoastronomy in the Pueblo Southwest,” in *World Archaeoastronomy*, ed. Anthony F. Aveni (Cambridge: Cambridge University Press, 1989), 143–66, esp. 144–45.

55. For a description of this star panel and a summary of the literature on Navajo constellations, see Von Del Chamberlain, “Navajo Constellations in Literature, Art, Artifact and a New Mexico Rock Art Site,” *Archaeoastronomy* 6 (1983): 48–58, esp. 56–58.

56. Von Del Chamberlain, “Navajo Indian Star Ceilings,” in *World Archaeoastronomy*, ed. Anthony F. Aveni (Cambridge: Cambridge University Press, 1989), 331–40, esp. 335.

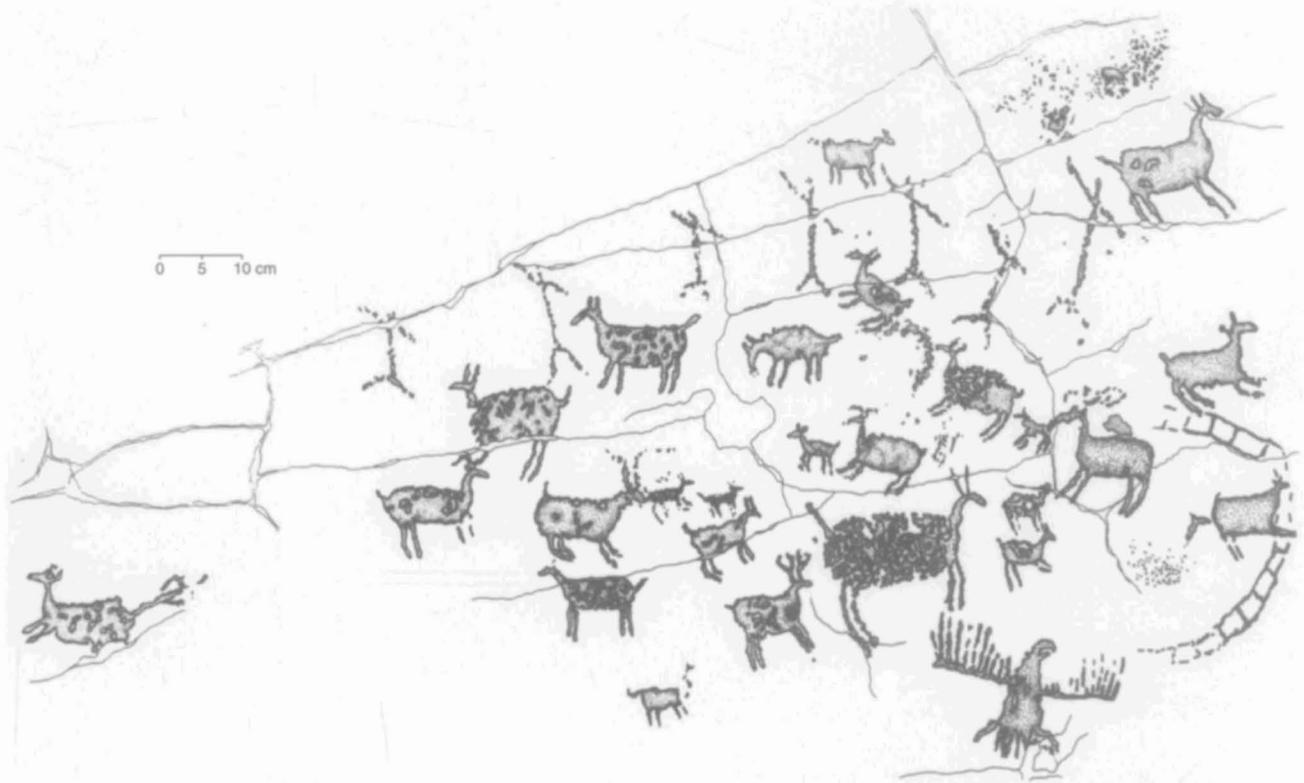


FIG. 4.8. PETROGLYPH PANEL SHOWING HUNTERS, ANIMALS, AND ENCLOSURE. Representation of an animal drive in a petroglyph in the Pinon Canyon Maneuver Site near the Purgatoire River, southeast Colorado. The ceremonial purpose of this image, which is similar to others in rock art of Europe and Asia, is suggested by the bird protecting the lower end of the net or enclosure (lower right) as representing the power of birds in shaman lore. “The humans with their outstretched arms are the herders who are driving the animals toward the net, which has been set across their pathway”

primarily ceremonial, they also, to a lesser degree, serve mnemonic functions. The changing of the seasons in the past were noted by positions of the constellations in the sky. Some of these sites may have helped remind people of this use of the constellations. Each constellation has a story or legend connected with it. These star paintings could remind medicine men of the constellations and the story they depict. In this capacity, they can also be used to train apprentice medicine men.⁵⁷

Campbell Grant agreed with Britt that it was possible to distinguish actual star patterns on the ceilings.⁵⁸ But in a much later and more cautious review of the evidence, Chamberlain concluded that the ceilings did not reveal similar star patterns so consistently present in the rock art star panel in the Largo Canyon or in other Navajo art described above. Confirmed by interviews with Navajos and Hopis, he inclined toward an interpretation of the pattern of these star crosses not as constellations, but as

(Lawrence L. Loendorf and David D. Kuehn, 1989 *Rock Art Research Pinon Canyon Maneuver Site, Southeastern Colorado* [Grand Forks: University of North Dakota, Department of Anthropology, 1991], 220–26, esp. 226). Analysis of potassium + calcium/titanium ratios in the varnishes accumulating on the rock art have enabled archaeologists to date various different elements and show a change in style over time. A quadruped in this image has been dated to 450 ± 75 years B.P. By permission of Lawrence L. Loendorf, New Mexico State University, Las Cruces, N.Mex.

a symbolic protection from the danger of rockfalls from the ceilings. His arguments are convincing and underline the problems of interpreting patterns of marks as maps in rock art.⁵⁹

NORTHEAST

Northeastern North America was home mainly to Algonquian- and Iroquoian-speaking peoples, among which there was great cultural diversity. In addition, the time and circumstances of their contact with Europeans, although among the earliest in North America, varied sub-

57. Claude Britt, “Early Navajo Astronomical Pictographs in Canyon de Chelly, Northeastern Arizona,” in *Archaeoastronomy in Pre-Columbian America*, ed. Anthony F. Aveni (Austin: University of Texas Press, 1975), 89–197, esp. 104–6.

58. Campbell Grant, *Canyon de Chelly: Its People and Rock Art* (Tucson: University of Arizona Press, 1978), 218–21.

59. Chamberlain, “Star Ceilings,” 339 (note 56).

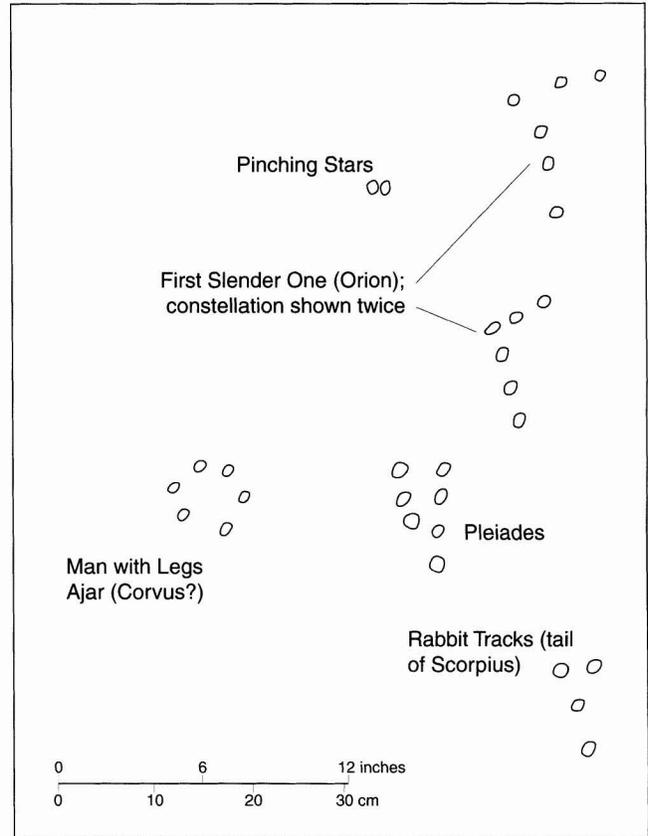


FIG. 4.9. STAR PANEL IN LARGO CANYON, NEW MEXICO. Star patterns in this panel from Largo Canyon drainage of northern New Mexico are represented by light dots in the figure; dark spots are natural holes. Chamberlain identifies Orion, the tail of Scorpius, Pinching Stars, Pleiades, and possibly Corvus.

From Von Del Chamberlain, "Navajo Constellations in Literature, Art, Artifact and a New Mexico Rock Art Site," *Archaeoastronomy* 6 (1983): 48–58, esp. 57. By permission of Von Del Chamberlain, Salt Lake City, Utah.

stantially. East Coast groups had sustained contact with French and English settlers and traders in the sixteenth and seventeenth centuries, whereas areas farther inland were not greatly affected until late in the eighteenth century. These factors are reflected in the surviving corpus of cartographic artifacts and texts. Few artifacts survive from earlier centuries, and early accounts, though relatively plentiful, often provide little information about the process of mapping or the maps themselves.⁶⁰

EPHEMERAL MAPS

Among the oldest European accounts of cartographic interest are those describing Indians drawing, inscribing, or modeling ephemeral maps. French and English explorers and colonists in New England and New France and the Chesapeake Bay area noted that native people could produce maps on request, and a few witnessed maps being made by Indians for other Indians. In the earliest account, Jacques Cartier, in the course of ascending the St. Lawrence River below the confluence of the Ottawa River in

1541, portaged around the lowest of the Lachine Rapids. Reaching the Cascades Rapids beyond, he could get no farther and asked four St. Lawrence Iroquoian men for information about conditions upstream. They responded "with certaine little stickes, which they layd upon the ground in a certaine distance, and afterward layde other

60. One very early account, from sixteenth-century Englishman Ralph Lane's narrative of the Roanoke Island colony, refers to a "report of all the country" that was "set downe" by Skiko, son of the King of Chawanokes (North Carolina Algonquians), in the Chesapeake Bay region. Richard Hakluyt, *The Principal Navigations Voyages Traffiques and Discoveries of the English Nation*, 12 vols. (Glasgow: James MacLehose, 1903–5), 8:329. Lane's published account may have been purposefully vague to conceal information on the area from the Spanish. David B. Quinn, ed., *New American World: A Documentary History of North America to 1612*, 5 vols. (New York: Arno Press, 1979), 3:295. In another case Samuel de Champlain wrote that in 1611 Hurons "spoke to me . . . in great detail, showing me by drawings all the places they had visited, taking pleasure in telling me about them." Henry Percival Biggar, ed., *The Works of Samuel de Champlain*, 6 vols. (Toronto: Champlain Society, 1922–36), 2:192. If the drawings were indeed maps, they may have covered a very large area.

small branches between both, representing the Saults [Rapids].” Hakluyt’s account is followed by the statement, “Here after followeth the figure of the three Saults,” but none was reproduced.⁶¹ There is little doubt, however, that the placing of the “little stickes” modeled the three Lachine Rapids and the St. Lawrence River for an undetermined distance beyond.

In 1602, on board a ship off the coast of southern Maine, a Micmac Indian “with a piece of Chalke described the Coast thereabouts” for Bartholomew Gosnold, the first European to sail along it since Estavão Gomes almost eighty years before.⁶² Three years later and eighty kilometers farther south, Samuel de Champlain was in conversation with either Pawtuckets or Massachusetts on a beach at Cape Ann. After he had “drawn for them with a charcoal the bay and the Island Cape, where we then were, they pictured for me with the same charcoal another bay which they represented as very large. Here they placed six pebbles at equal intervals, giving me thereby to understand that each one of these marks represented that number of chiefs and tribes.” The Indians also added the Merrimack River, whose mouth he had failed to see because of fog and a bay bar.⁶³ Although Champlain provided a cue for the Indians, he had been with them for only a few hours, and it is unlikely they had had previous contacts with Europeans.

From the early seventeenth century through the eighteenth century, many examples were noted of ephemeral maps made by Indians of the Northeast. Shortly after Jamestown was founded, a Virginia Algonquian “offred with his foote to describe” the James River from Chesapeake Bay perhaps as far upstream as the Blue Ridge.⁶⁴ In Upper New York Bay, an Indian who was probably a member of the Munsee-speaking group of the Delawares drew for Thomas Dermer in 1619 “a Plot with Chalke upon a [sea?] Chest.” It apparently represented Manhattan Island, the lower Hudson and East Rivers, the turbulent waters at Hell Gate, and the Harlem River.⁶⁵ On the southern Delmarva Peninsula of Chesapeake Bay in 1650, a Pocomoke used a stick to make “divers circles by the fire-side . . . [giving] to every hole a name” such that Henry Norwood found it was not hard to conceive “that the several holes were to supply the place of a sea-chart, shewing the situation of the most noted *Indian* territories.”⁶⁶ In 1670 an elderly Monacan described with a staff for John Lederer “two paths on the ground” from the present site of Richmond, Virginia, into the Appalachians beyond.⁶⁷ Another elderly Indian known as the Pheasant informed George Washington in 1770 about the upper part of the Buffalo (now Bull) Creek valley south of the Ohio River in what is now Washington County, Pennsylvania. He “chalkd out . . . upon his Deer skin” the situation of “a fine piece of Land and beautiful place for a House.”⁶⁸

Oneidas used modeling techniques in 1634 to make a map for the Dutch traders Harmen Meyndertsz van den Bogaert and Jeronimus de la Croix, employees of the Dutch West India Company. Van den Bogaert wrote that, while at the village of the Oneidas near modern Munnsville, New York, “we asked them for the locations of all of their castles and for their names, and how far they were from one another. They put down kernels of corn and stones, and Jeronimus made a map from them. We reckoned everything in miles; how far every place was from one another.”⁶⁹

Gesture was an important element of many ephemeral maps, and some maps were entirely gestural. On 9 November 1761 Aikon Aushabuc, a Micmac chief, explaining the current geopolitical situation to Gamaliel Smethurst, an Englishman in the captivity of his band,

made almost a circle with his forefinger and thumb, and pointing at the end of his forefinger, said there was Quebec, the middle joint of his finger was Montreal, the joint next the hand was New-York, the joint of the thumb next the hand was Boston, the middle joint of the thumb was Halifax, the interval betwixt his finger and thumb was Pookmoosh [the place they were], so that the Indians would soon be surrounded, which he signified by closing his finger and thumb.⁷⁰ (See fig. 4.10).

They had long been allied with the French, and the cities Aikon Aushabuc pointed out were centers of British

61. Hakluyt, *Principal Navigations*, 8:270–71.

62. Samuel Purchas, *Purchas His Pilgrimes*, 4 vols. (London, 1625), vol. 4, pt. 8, p. 1647.

63. Biggar, *Works of Samuel de Champlain*, 1:335–36 (note 60).

64. “A relatyon . . . written . . . by a gent. of y^e Colony.” [Captain Gabriel Archer?], manuscript, Public Record Office, London, State Papers Colonial (C.O. 1/1, fol. 46v), printed in Philip L. Barbour, ed., *The Jamestown Voyages under the First Charter, 1606–1609*, 2 vols., Hakluyt Society Publications, ser. 2, nos. 136–37 (Cambridge: Cambridge University Press, 1969), 1:80–98, esp. 82. The Indian was then given a pen and paper and “layd out the whole River.”

65. Purchas, *Purchas His Pilgrimes*, vol. 4, pt. 9, p. 1779 (note 62).

66. Henry Norwood, “A Voyage to Virginia,” in *A Collection of Voyages and Travels*, 3d ed., 6 vols., comp. Awnsham Churchill and John Churchill (London, 1744–46), 6:161–86, esp. 181.

67. John Lederer, *The Discoveries of John Lederer . . . Collected and Translated out of Latine . . . by Sir William Talbot* (London: Samuel Heyrick, 1672), 9.

68. John C. Fitzpatrick, ed., *The Diaries of George Washington, 1748–1799*, 4 vols. (Boston: Houghton Mifflin, 1925), 1:439. The Pheasant was possibly a Mingo.

69. Charles T. Gehring and William A. Starna, trans. and eds., *A Journey into Mohawk and Oneida Country, 1634–1635: The Journal of Harmen Meyndertsz van den Bogaert* (Syracuse: Syracuse University Press, 1988), 14.

70. Gamaliel Smethurst, *A Narrative of an Extraordinary Escape out of the Hands of the Indians, in the Gulph of St. Lawrence* (London, 1774), 14.

influence. Halifax had been established as a British military base in 1749, and Montreal and Quebec had fallen to the British in 1759 and 1760. Although these sites were quite distant from the New Brunswick coast where the exchange took place, Aikon Aushabuc's awareness was probably heightened by local conflicts between the French and the British.⁷¹

These early descriptions of ephemeral maps introduce several attributes that are also characteristic of later maps. Like many surviving maps, they were made for Europeans, often to extend Europeans' knowledge into their terra incognita. Maps were commonly produced by inscribing in earth or drawing with chalk or charcoal on a floor or deck, which made the map inevitably short-lived. In several cases objects such as sticks and stones represented natural or cultural features. On the map made for Henry Norwood in 1650, circles symbolized settlements. It is even possible that the relative size of the circles reflected the importance of places.⁷²

Two other descriptions of ephemeral mapmaking came out of activities that, although observed by Europeans, seem to have been based in indigenous custom. In the first instance Champlain described how in 1609, when expecting possible conflict with the Iroquois, the headmen of alliances of Hurons, Algonquins, and Montagnais would brief their warriors by allocating a specific stick to each man, inserting the sticks vertically in battle order in a specially leveled-off place about six feet square in the woods, then instructing the men "to arrange themselves in the order in which they have seen these sticks."⁷³

John Smith, held captive by Virginia Algonquians in 1607, saw them make a cosmographical map as part of a three-day ceremony. It showed their country, marked with a circle of cornmeal, the boundaries of the circumambient ocean marked with corn kernels, and sticks placed in a pile to signify the British Isles from which John Smith had come (fig. 4.11). Although the end product was modeled on the earth floor of a longhouse and may have survived only a few hours or at most days, much of the information content was incorporated in the "strange gestures and passions," invocation, and song that were part of the ceremony.⁷⁴ On an engraving depicting one stage in the event, it is described as "Their Coniuration" (fig. 4.12).

Another ephemeral map made for John Smith in late summer or autumn 1608 by Powhatan, a leader of the Virginia Algonquians, appears to have been intended to correct an impression that there was a sea to the west beyond the mountains, perhaps derived in part from the idea of the circumambient ocean mapped during the earlier ceremony. Powhatan told Smith that as for "any salt water beyond the mountaines, the relations you haue had from my people are false." Powhatan then "began to draw plots vpon the ground (according to his discourse)

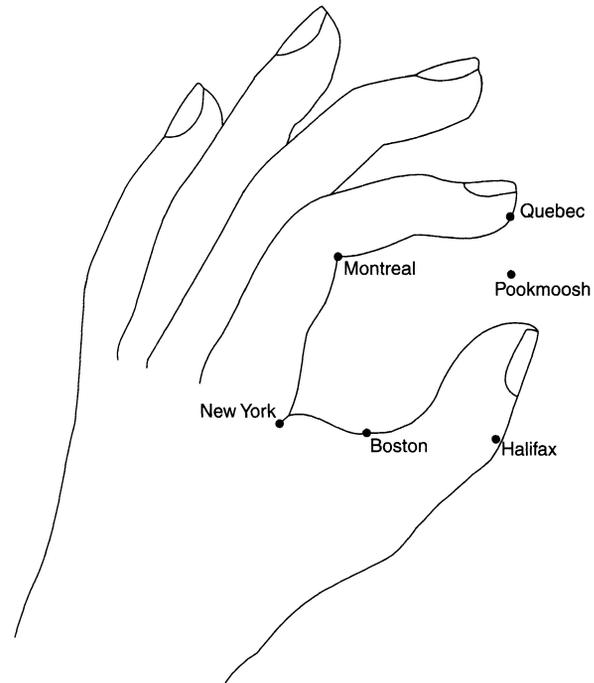


FIG. 4.10. RECONSTRUCTION OF AIKON AUSHABUC'S GESTURAL MAP.

of all those regions."⁷⁵ In spite of this information, perhaps in hope that the Pacific Ocean was near, Smith indicated a stippled lake or sea far beyond the headwaters of the Potomac River in his 1612 map of Virginia (fig. 4.13). The coast and stretch of water at the upper right could have been the shoreline of Lake Erie, the Pacific Ocean, or the cosmographical circumambient ocean Smith had seen them represent in their "coniurations."

It is possible that a little-known manuscript map, tentatively dated 1608, was derived at least in part from the

71. *Historical Atlas of Canada*, 3 vols. (Toronto: University of Toronto Press, 1987–93), vol. 1, pls. 30 ("Acadian Deportation and Return," by Jean Daigle and Robert LeBlanc) and 42 ("The Seven Years' War," by W. J. Eccles and Susan L. Laskin).

72. The critical phrase in Norwood's account (note 66 above) is "divers circles." Spelled in that way at that date, "divers" could simply have meant sundry or several; it could also have meant diverse (different in character or quality; not of the same kind). William Little, H. W. Fowler, and Jessie Coulson, *The Shorter Oxford English Dictionary on Historical Principles*, 3d. rev. ed., 2 vols., ed. C. T. Onions (Oxford: Clarendon Press, 1973), 1:585. If the latter, then it is reasonable to assume that the Pocomoke mapmaker was using the circles to indicate the relative sizes or importance of settlements or groups.

73. Biggar, *Works of Samuel de Champlain*, 4:87 (note 60).

74. John Smith, *The Generall Historie of Virginia, New-England, and the Summer Isles: With the Names of the Adventurers, Planters, and Governours from Their First Beginning An^o 1584 to This Present 1624* (London: Michael Sparkes, 1624), 48.

75. John Smith et al., *A Map of Virginia, with a Description of the Country, the Commodities, People, Government and Religion* (1612); see Barbour, *Jamestown Voyages*, 2:414 (note 64).

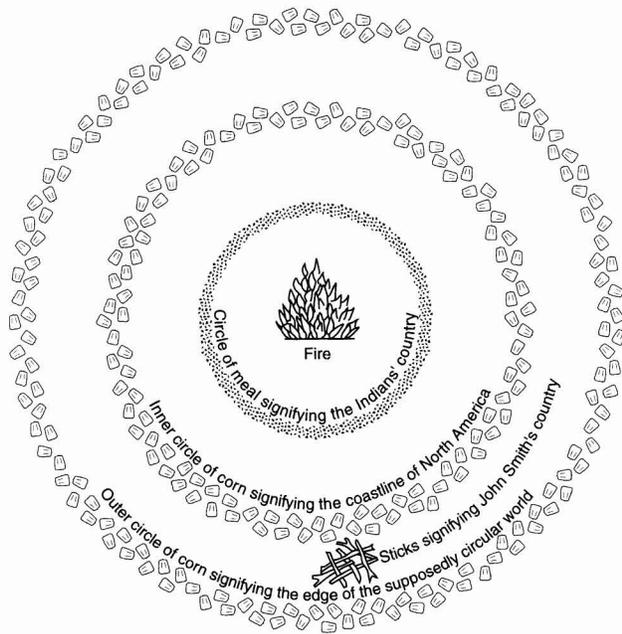


FIG. 4.11. RECONSTRUCTION OF A VIRGINIA ALGONQUIAN COSMOGRAPHY. This reconstruction is based on the model of the world by Powhatans described by John Smith (*Generall Historie of Virginia* [1624], 48). The Indians' model was constructed in the course of three days of incantations during the time they held Smith captive in 1607. See figure 4.12 for a contemporary engraving of the event, in which, however, the only common component is the central fire.

“plots” made by Powhatan. The recently discovered map (fig. 4.14) was supposedly drawn by George Percy, who was probably with Smith when he met Powhatan at Werowocomoco. Significantly, Werowocomoco is one of only two named villages among the seventy marked on the map. Even more significantly, the rivers draining east toward Chesapeake Bay are represented as rising in a straight ridge, beyond which three short rivers drain in the opposite direction into what looks more like a right-to-left-flowing river than a sea. The latter could well have been Powhatan's representation of the southwest-flowing Allegheny–Upper Ohio River with three of its left bank tributaries that rise in the Allegheny Mountains and flow essentially northwest.

In addition to these accounts, the legacy of ephemeral and gestural maps (as well as other kinds of Indian cartographic knowledge) can be found in European maps of the early postcontact period. The “Velasco map” of the northeast coast of North America and adjacent interior affords a good example. Compiled in London in 1611 or just before, it has 5 to 10 percent of its linework enhanced with blue and labeled as having been “done by the relations of the Indians.” In the early seventeenth century, a “relation” was the action of relating (telling) in words. Although the sources are not acknowledged, the compiler of the Velasco map almost certainly used geographical



FIG. 4.12. VIRGINIA ALGONQUIANS (POWHATANS) MODELING A COSMOGRAPHICAL MAP IN 1607. This is one of six scenes illustrating John Smith's adventures that surround a map of Virginia. The ceremony depicted involved the construction of an ephemeral cosmographical map. See figure 4.11 for a modern reconstruction of the model.

Size of this scene: ca. 13.1 × 11.5 cm. From John Smith, *The Generall Historie of Virginia, New-England, and the Summer Isles: With the Names of the Adventurers, Planters, and Governours from their First Beginning Anno 1584 to This Present 1624* (London: Michael Sparkes, 1624). Photograph courtesy of the Huntington Library, San Marino, Calif. (RB 19417).

information given by several northeastern Indians as reported by Samuel de Champlain and one or more members of John Smith's Virginia explorations.⁷⁶ The Indian

76. Although the evidence has not been analyzed conclusively, the representations of Lakes Champlain and George, the uppermost stretch of the St. Lawrence River, and Lake Ontario appear to have been derived from accounts given to Champlain by Algonquins in June 1603, as reported in Samuel de Champlain, *Des Sauvages; ou, Voyage de Samvel Champlain de Brovage, fait en la France nouvelle, l'an mil six cens trois* (Paris: Claude de Monstr'oeil, 1603). For an English translation of the relevant passages see Quinn, *New American World*, 4:403–7 passim (note 60); the map is reproduced in William Patterson Cumming, R. A. Skelton, and David B. Quinn, *The Discovery of North America* (New York: American Heritage Press, 1971), 326–27. The evidence is less conclusive for the representation of the hinterland of Virginia having been based on reports given by Indians to John Smith during one or more of his four explorations in 1607 and 1608. It is certainly not based on Smith's printed map, “Virginia,” published in 1612 (fig. 4.13), although that map does employ Tuscan crosses on the main rivers and mountains to mark the limits of what had been discovered. There is a very real possibility that in 1610 the compiler of the Velasco map was in Virginia and had access to variants of the geographical information obtained by Smith from Powhatan's Algonquian Indians and the Susquehannocks to the north.



FIG. 4.13. VIRGINIA (1612), BY JOHN SMITH. Published in 1612 in John Smith et al., *A Map of Virginia, with a Description of the Country, the Commodities, People, Government and Religion* (1612). The legend on the map differentiates between areas and features that “hath bin discovered” and those learned about “by relation” of the Indians. The main text is more specific: “as far as you see the little Crosses on riuers, mountaines, or other places haue bene discovered; the rest was had by information of the Savages, and are set downe, ac-

ording to their instructions” (Philip L. Barbour, ed., *The Jamestown Voyages under the First Charter, 1606–1609*, 2 vols., Hakluyt Society Publications, ser. 2, nos. 136–37 [Cambridge: Cambridge University Press, 1969], 2:344). The small body of water at the upper right could have represented part of Lake Erie, the Pacific Ocean, or the cosmographical circumambient ocean.

Size of the original: 33 × 42 cm. By permission of the British Library, London (G7037).

component of the Velasco map was of areas beyond the limits of European experience: Lakes Champlain, George, and Ontario and the upper Susquehanna and Potomac Rivers, with what may have been the south coast of Lake Erie beyond. As the frontiers of Euro-American exploration expanded, such incorporations were less necessary, although traces remained.⁷⁷

MAPS MADE FOR EUROPEANS

In addition to these ephemeral maps, there may have been others that were made with more permanent materials

but did not survive. For example, while exploring the St. Lawrence River in 1603, Samuel de Champlain ob-

77. For example, maps and geographical intelligence collected from Crees on or near the northwest shore of Lake Superior by Pierre Gaultier de Varennes et de La Vérendrye in 1728–29 were mosaicked to create a false geography of the then Northwest structured around a great river rising just to the northwest of Lake Superior and flowing due west to, at least by implication, the Pacific Ocean via a westwardly displaced Lake Winnipeg, a little Red River, and a mountain of bright stones, to a place where its waters began to ebb and flow. This error was to persist on printed maps in progressively debased forms for approximately seventy years: Lewis, “Misinterpretation of Amerindian Information,” 546–56, and idem, “La Grande Rivière,” 54–62 (both in note 2).



FIG. 4.14. 1608 MANUSCRIPT MAP, POSSIBLY A TRANSCRIPT OF POWHATAN'S MAP MADE ON THE GROUND OF AREAS TO THE WEST AND NORTH OF CHESAPEAKE BAY. The little-known "Kraus Virginia map" has many Indian characteristics. In part at least, it may have been derived from the "plots" made on the ground by the Virginia Algonquian Powhatan for Captain John Smith. It was supposedly drawn by George Percy, who was probably with Smith when he met Powhatan at Werowocomoco in 1608. Significantly, this is one of only two named Indian villages among the seventy marked. The semicircle symbol used for these villages may have been derived from the Algonquian's barrel-roofed lodges as seen in end profile. The angular geometry of the drainage network is very characteristic of Indian

tained two sketches of the upper stretches of the river and beyond that appear to have included considerable detail, including information on distances, given by Champlain in leagues but probably converted from travel times. He apparently requested the information a second time to confirm it.⁷⁸ Neither version survived. Maps made in later stages of Euro-American settlement in the context of negotiations over land or trade had better odds of survival. Sometimes they were preserved as official records, and even if they were not, the settled circumstances of Euro-

maps. The rivers draining east toward Chesapeake Bay are represented as rising in a straight ridge, beyond which three short rivers drain in the opposite direction into what looks more like a river flowing right to left than a sea. The whole system could well be a representation of the southwest-flowing Allegheny–Upper Ohio River, with three of the left bank tributaries that rise in the Allegheny Mountains and flow essentially northwest. This interpretation is in keeping with Powhatan's intent to counter his people's earlier account of a sea to the west of the mountains.

Size of the original: 48.5 × 63 cm. Photograph courtesy of the Harry Ransom Humanities Research Center, University of Texas at Austin.

Americans created a more favorable environment for preservation. These maps, generally either created on or transcribed onto paper, reflect both indigenous cartographic principles and the exigencies of the transactions they were created for. Their interpretation is complicated because in many cases Europeans supplemented the maps, or in the course of transcribing them may have omitted material they found incomprehensible or ir-

78. Biggar, *Works of Samuel de Champlain*, 1:153–61 (note 60).

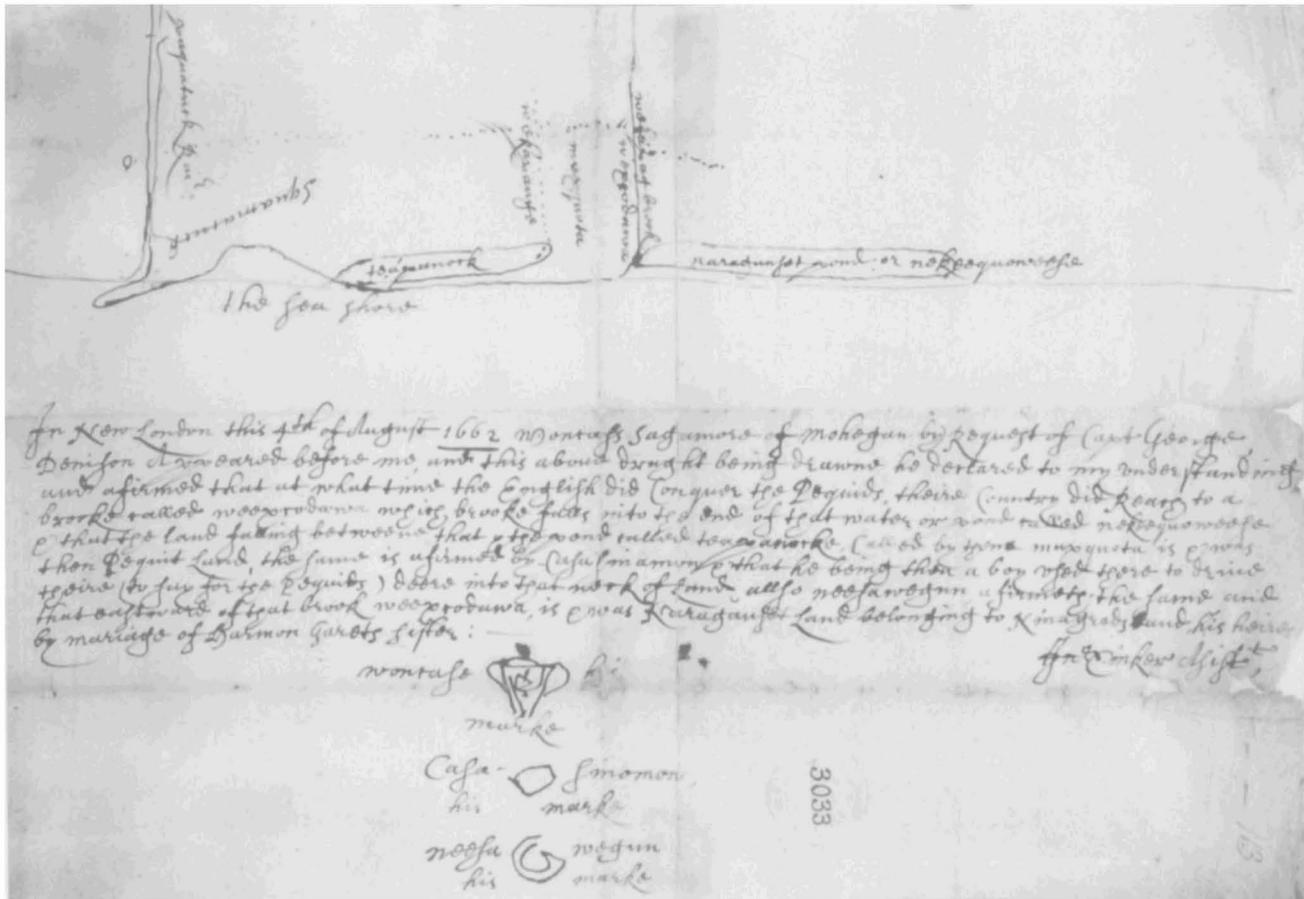


FIG. 4.15. CONTEMPORARY TRANSCRIPT OF A PROBABLE INDIAN MAP RECONSTRUCTING THE EASTERN EXTENT OF PEQUOT COUNTRY BEFORE 1637. A supplemented manuscript transcript, 4 August 1662, ink on paper, by John Tinker of a 1662 Indian map (probably Pequot, Mohegan, and Narragansett) reconstructing the eastern extent of Pequot country before 1637. Deer were driven into the

“neck of Land” between two elongate coastal ponds in what is now southwestern Rhode Island. Size of the sheet: 23 × 33.5 cm; size of the map portion: ca. 8.5 × 33.5 cm. Photograph courtesy of the Massachusetts Archives Collection, Massachusetts State Archives, Boston (vol. 30, p. 113, stamped “Mass. Archives Maps and Plans #3033”).

relevant, making reconstruction of the original virtually impossible.⁷⁹

Neither Indians nor Inuit had a tradition of exclusive ownership of precisely bounded land, yet their maps were used in land negotiations with Europeans. In 1662 John Tinker transcribed a map recording the extent of Pequot country before 1637 in what is now southwestern Rhode Island (fig. 4.15). According to Tinker’s legend, the original was made by one member of each of the three nations living in the area at the time; a Pequot, a Mohegan, and a Narragansett. The map was made as part of an attempt to settle a dispute over land between the Connecticut and Massachusetts colonies, but also reflects Indian concerns. An inscription includes a statement by the Mohegan concerning land marked on the map between two coastal ponds “that he being then a boy used there to drive their (to say for the Pequids) deere into that neck of Land.” Indian maps often mark favorable locations for food resources, including edible plants, but especially animals.

Another example is a map made in 1666 or 1668 delimiting a rectangular area of land in what is now southern Massachusetts that the Pokanoket (Wampanoag) sachem King Philip (Metacom) was prepared to sell to the Plymouth Colony (fig. 4.16).⁸⁰ It was drawn and anno-

79. A series of maps on paper were made in a different context by Shanawdithit, the last of the Newfoundland Beothuks, shortly before her death in 1829. While living in St. John’s she made several drawings, including five detailed maps representing a series of critical events in Anglo-Beothuk relations between 1810 and 1823. The original pencil drawings, heavily annotated by W. E. Cormack who obtained them, are in the Newfoundland Museum, St. John’s (NF 3304–8). They are described and reproduced in James P. Howley, *The Beothuks or Red Indians: The Aboriginal Inhabitants of Newfoundland* (Cambridge: Cambridge University Press, 1915), 238–46 and sketches I–V, and Warhus, *Another America* (note 28). See also Matthew Sparke, “Between Demythologizing and Deconstructing the Map: Shanawdithit’s Newfoundland and the Alienation of Canada,” *Cartographica* 32, no. 1 (1995): 1–21.

80. There has been confusion about whether the draft shows lands

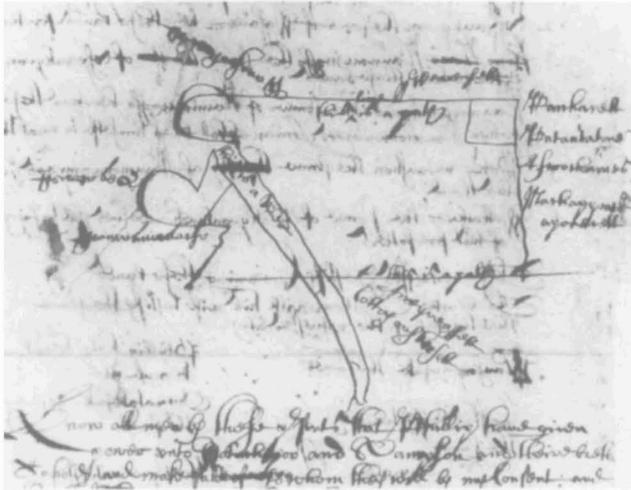


FIG. 4.16. MAP DELIMITING AN AREA OF THE SOUTHERN COAST OF WHAT IS NOW MASSACHUSETTS THAT METACOM (KING PHILIP) WAS WILLING TO SELL TO THE PLYMOUTH COLONISTS. A seventeenth-century clerk's copy of a 1666 or 1668 map that was part of a land deed. The original was drawn by John Sassamon, a Harvard-educated Massachusetts Indian who acted as secretary to King Philip. The copy is difficult to read, and one critical word has been read by some as "now" and by others as "not." This has caused uncertainty whether the enclosed area is the land "wee are" now or not "willing should be sold." In cartographic terms, did the boundary enclose lands available for sale or delimit lands that were being withheld? See also note 80. Size of the original or clerk's transcript: 17 × 26.5 cm. Bound in "Indian deeds, Treasurer accounts; Lists of Freemen," by permission of the Plymouth County Commissioners, Plymouth Court House, Plymouth, Mass. Photograph courtesy of the Dublin Seminar for New England Folklife, Concord, Mass.

tated for him by his secretary, John Sassamon, a Massachusetts Indian who had been educated at Harvard College. On the evidence of the map alone it would have been impossible to know what King Philip and Sassamon intended, because the drawing was scaleless and lacked information inland from the coast (see fig. 4.17).

Map content was shaped by the circumstances of interaction with Europeans as well as by geographical knowledge. On 7 September 1683 at Albany, New York, the English trader Robert Livingston obtained from two Cayugas and one Susquehannock a map of the Susquehanna River (fig. 4.18). The map was almost certainly transcribed or enhanced by Livingston. On the map, the course of the Susquehanna is markedly simplified, and all the important west bank tributaries of that river are represented, also simplified, down to and including the confluence with West Branch. The river is represented down to its mouth on Chesapeake Bay. Conversely, though well within the mapped area, the map omits each of the east bank tributaries as well as the Juniata, an important west bank tributary of the lower Susquehanna. The reason for

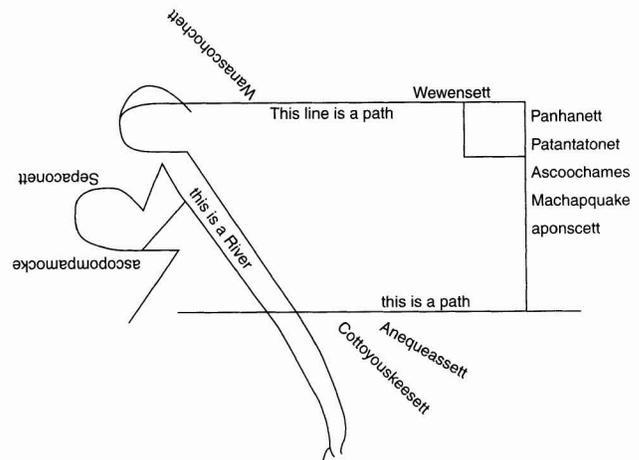


FIG. 4.17. REDRAWING OF THE MAP OF THE LAND KING PHILIP WAS WILLING TO SELL TO THE PLYMOUTH COLONISTS (FIG. 4.16). After *Records of the Colony of New Plymouth in New England*, vol. 12, *Deeds, &c.*, 1620–1651. *Book of Indian Records for Their Lands* (Boston: W. White, 1861), 223–44, esp. 237.

the omissions is implicit in the endorsement: "Draught of y^e Susquehannes River & how soon ye Indians westward can come there." This is elaborated on in a long inscription on the front:

This draught is taken from 3 Indians, 2 [of them] Cajouges . . . and [the other one a] Susquehannes that Live amongst ye onnandages, . . . [They] asked why so Exact an account of ye Susquehannes River was de-

that King Philip is "not" willing to sell or "now" willing to sell (e.g., Peter Benes, *New England Prospect: A Loan Exhibition of Maps at the Currier Gallery of Art, Manchester, New Hampshire* [Boston: Boston University for the Dublin Seminar for New England Folklife, 1981], 75–76). The full statement from *Records of the Colony of New Plymouth in New England*, vol. 12, *Deeds, &c.*, 1620–1651. *Book of Indian Records for Their Lands* (Boston: W. White, 1861), 223–44, esp. 237, reads:

This may informe the honor Court that I Phillip ame willing to sell the Land within this draught; but the Indians that are vpon it may liue vpon it still but the land that is [waste] may be sold and Watachpoo is of the same mind; I haue set downe all the principall names of the land wee are not willing should be sold.

ffrom Pacanaukett

the 24th of the 12th month 1668

PHILLIP [his mark]

A recent interpretation of this map has located the lands for sale as being along and to the northwest of that part of the southeast coast of Massachusetts now known as Buzzards Bay, between Charles Neck and Wings Cove. It has also offered a solution to the apparent contradiction between land "not" and "now" for sale, the former being the lands with toponyms outside the rectangular area and the latter the lands without toponyms within it. Margaret W. Pearce, "Native Mapping in Southern New England Indian Deeds," in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis (Chicago: University of Chicago Press, 1998), chap. 7.

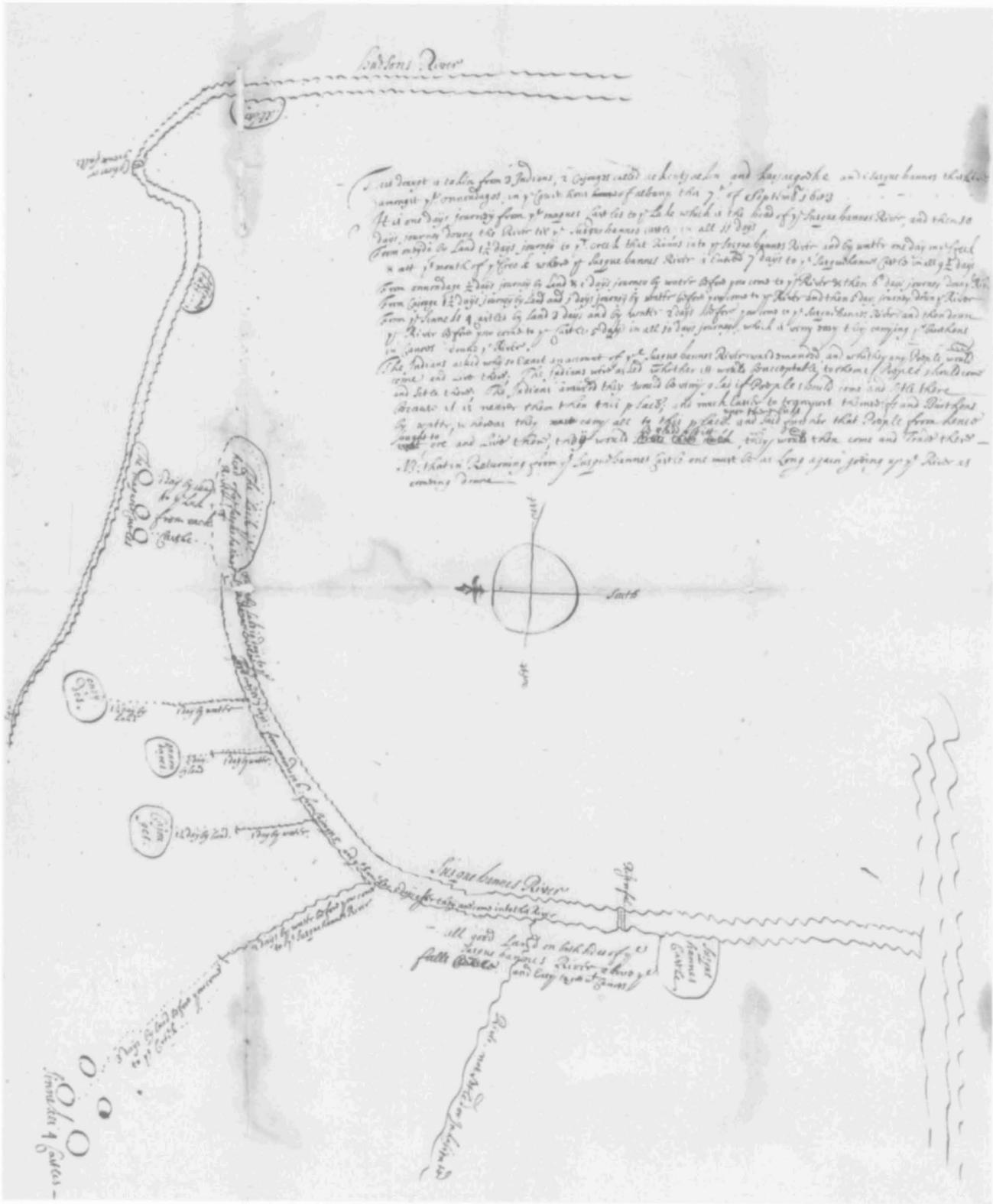
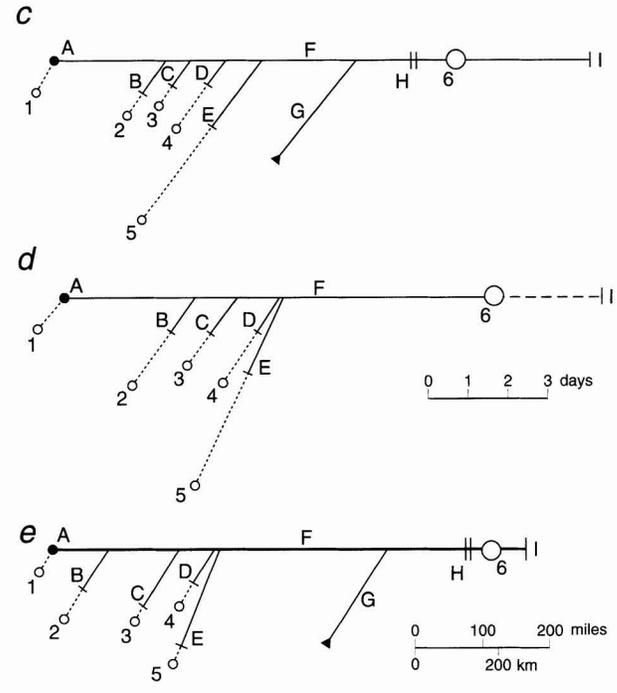
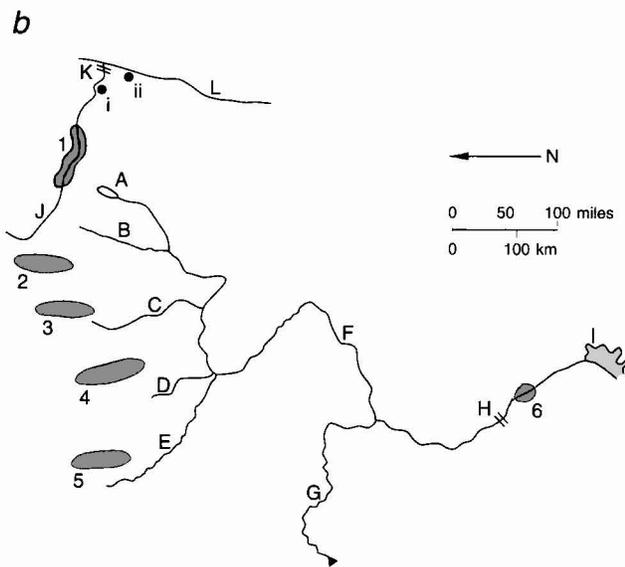
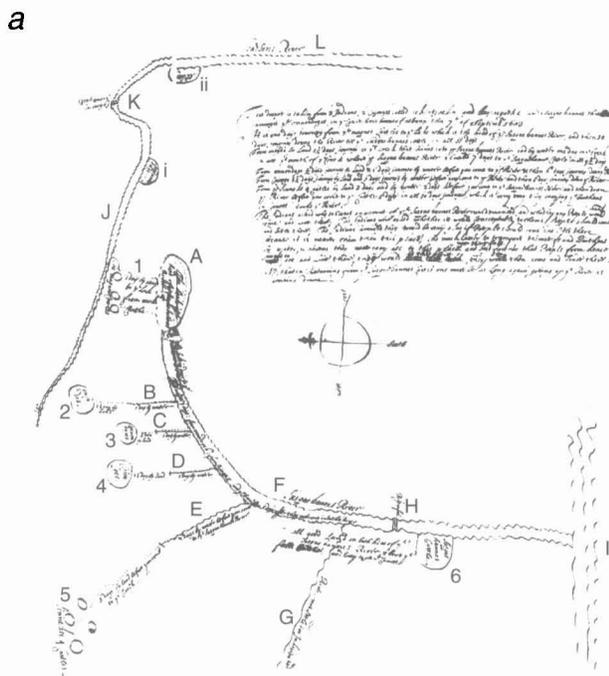


FIG. 4.18. MAP OF THE SUSQUEHANNA RIVER AND ITS POTENTIAL SIGNIFICANCE IN IROQUOIS TRADE TOWARD CHESAPEAKE BAY. "Draught of Ye Susquehannes River" by two Cayugas (Ackentjaekon and Kaejaegoeh) and one unnamed Susquehannock, 7 September 1683. Made on request, this map is particularly interesting in presenting pos-

sible future trading relationships via a route long used by Indians but virtually unknown to the English colonists in New York. Size of the original: 39.5 × 30.5 cm. Photograph courtesy of the Pierpont Morgan Library, New York (GLC 3107–Livingston Collection).



- | Rivers from source
- ▶ Rivers not from source
- - - Rivers not scaled
- ⋯ Portages
- = Falls
- Indian castles

- A. Otsego Lake
 - B. Unadilla River
 - C. Tioughnioga River
 - D. Cayuga Creek
 - E. Chemung River
 - F. Susquehanna River
 - G. West Branch Susquehanna
 - H. Conewago Falls
 - I. Chesapeake Bay
 - J. Mohawk River
 - K. Cohoes Falls
 - L. Hudson River
- Tribal areas
 - 1. Mohawks
 - 2. Oneidas
 - 3. Onondagas
 - 4. Cayugas
 - 5. Senecas
 - 6. Susquehannocks
- Non-native settlements
 - i Schenectady
 - ii Albany

FIG. 4.19. MAPPED DISTANCES AND JOURNEY TIMES ON THE SUSQUEHANNA RIVER ROUTE. *a* is the Cayuga-Susquehannock map of 1683 (fig. 4.18); *b* maps the same information on a modern map. Distances are proportionally scaled in *c*, *d*, and *e*, and the length of the Susquehanna River is standardized between its source in Otsego Lake (A) and the Susquehannocks castle (6) (*c* is based on the 1638 map; *d* is based on days travel as given by Ackentjaekon; and *e* is based on river and portage distances on modern maps). Intervals on

the main river, tributaries, and portages are scaled proportionally. In the case of *d*, downstream travel times were used (“Returning from y^c Susquehannes [= Susquehannocks] Castle one must be as Long again going up y^c River as coming downe.”) Because travel times across the portages presumably would not be significantly different on return journeys, scaling by upstream times would have resulted in an appreciably different *d*.

manded [presumably by Livingston], and whether any People would come and Live there; The Indians were asked whether itt would be acceptable to them if People should come and Setle there: The Indians ansured

they would be verry glad if People should come and Setle there because it is nearer them then this place [Albany]; and much Easier to transport themselves and Burthens by water, whereas they muste carry all to this

place upon there baks; and said further that People from hence ought to goe and Live there, they would be gladd off itt, they would then come and Trade there.

Though “demanded” by one or more English traders, the map was quite clearly a plea by two presumably representative Iroquois Indians, supported by one Susquehannock who would also benefit, for the English to open a trading post on the lower Susquehanna River as an alternative to Albany on the Hudson River. The represented tributaries of the Susquehanna River were the ones they would then use to take their furs to the new post. With the exception of the West Branch of the Susquehanna River, the tributaries they would not use were all omitted from their map.

The map also omits the south shore of Lake Ontario, doubtless reflecting the long-standing antipathy of the Iroquois toward the French and an unwillingness to trade with them via the lake and the St. Lawrence River. In retrospect these cartographic silences are difficult to detect unless the purpose of the map is well documented and can be related to conditions and events within the wider region.

This map may employ scaling of distance by travel time. Journey times to the nearest half day are given for the sectors of the main river, for all but one of the represented tributaries, and for the portages beyond these to the Iroquois villages. Hence it is possible to compare spacings between key points on the Indians’ map with the journey times given and with distances taken from a modern map (fig. 4.19). The lengths of the portages are exaggerated, and presumably because travel time was given for downstream journeys, the rapidly flowing tributary streams are represented as shorter.

Annotators almost always failed to note when they replaced pictographs with text, added information given by the mapmaker in words or by gesture, or supplemented a map with information obtained elsewhere. Livingston’s long legend on his transcript of the 1683 map of the Susquehanna Valley is rich in information about days of travel by land and water along marked routes between specific points, but it is not made clear whether that information was represented pictographically on the original map.

On 2 March 1697 at Albany, Livingston either had made or acquired another map (fig. 4.20). The linework is inked over what appears to be original red crayon. The map represents places and features within the upper parts of four adjacent major river systems; the St. Lawrence, Connecticut, Hudson, and Susquehanna. Assembling all four rivers on one map makes some of the distortions enormous, particularly among lesser streams that had to be reoriented or have their lengths adjusted to represent important interbasin routes. For example, the hydrologi-

cally minor Oswego River system afforded vital canoe links between the Hudson-Mohawk, Susquehanna, and Great Lakes–St. Lawrence systems (see also fig. 4.103c). To demonstrate these canoe links, angular distortion and linear exaggeration were essential.⁸¹

Maps produced in the course of negotiations with Europeans were not always made with European materials. Negotiations between the Mississaugas and the British concerning land around Toronto in 1805 included a number of cartographic exchanges. In 1787 the Mississaugas sold the land known as the Toronto Purchase before an accurate survey had been done. In part the 1805 meeting was being held to establish “what had been the generally received opinion of the Mississaugas as to [that] boundary line.”⁸² During the meeting, the spokesman Quenepnon revealed an oral tradition of boundary:

All the Chiefs who sold the Land you speak of are dead and gone. I now speak for all the Chiefs of the Mississaugas. We cannot absolutely tell what our old people did before us, except by what we see on the plan [produced by Colonel William Claus, deputy superintendent of Indian Affairs] & what we remember ourselves and have been told. . . . Our old Chiefs told us that the line was on the East side of the Etobicoke following the course of the River upwards from the mouth of to the most Easterly bend of the same two or three miles up in a strait line. That the River then runs from the westward but a continuation of that strait line from the mouth of the River and intersecting that Easterly bend was the boundary.⁸³

On 1 August Quenepnon produced “a sheet of Bark with Lines representing the Tract they are willing to let their Father [King George III] have.”⁸⁴ As contemporarily described, it was certainly a boundary map

from the Etobicoke to Capn Brants’ Land on the margin of the Lake [Ontario] reserving a Mile on each side of the Credits to its source, half a mile on each side of

81. Another apparent distortion is the circuit shown from the St. Lawrence River above Montreal, via the Ottawa River, undifferentiated Lakes Huron and Erie, Niagara Falls, Lake Ontario, and the St. Lawrence River back to Montreal. Apparent hydrological impossibilities of this kind occur frequently on Indian maps when portages across primary watersheds are distinguished by neither linework nor symbols. In this case the unrepresented portage is that between the Ottawa River and the Lake Nipissing–French River system draining into Georgian Bay of Lake Huron. If, as is virtually certain, the marked lake is Lake Nipissing, then the long connecting link with undifferentiated Lakes Huron and Erie is another good example of distortions frequently arising from the need to represent linkages.

82. Colonel William Claus, deputy superintendent of Upper Canada, introducing the proceedings of a meeting with the Mississaugas at River Credit on 31 July 1805. National Archives of Canada, Ottawa, Lieutenant-Governor’s Office–Upper Canada, Indian Affairs (Correspondence, 1796–1806, RG 10, vol. 1), 290.

83. Correspondence, Quenepnon, on 31 July 1805, p. 290–91.

84. Correspondence, Quenepnon, on 1 August 1805, p. 296.

(Facing page)

FIG. 4.20. A PROBABLE INDIAN MAP OF PARTS OF FOUR MAJOR BUT SEPARATE DRAINAGE SYSTEMS, 1696 OR 1697. Such maps were common whenever strategic and especially transportation relationships were being represented within large areas, in this case, approximately 400,000 square kilometers. The map is manuscript, ink over red crayon on paper; endorsement on back: "alb^y 2 m[arch] 1696/7 Drafft of this Countrey."

Size of the original: 41.3 × 32.8 cm. Photograph courtesy of the Pierpont Morgan Library, New York (GLC 3107–Livingston Collection).

the Sixteen mile Creek & half a mile on each side of the Twelve mile Creek; A tract sold by them to the Tuscaroras near Brants land and Sugar Bush which they gave to Mrs Brant together with Two or three Chains wide the whole length of the Beech, that they may not be subject to be driven off, and said they are willing to give Two miles to the Northward of the road and all to the Southward of it except the Two or three Chains on the Beech.⁸⁵

The following day, Quenepenon "spoke with a flat stone in his hand on which was represented the lines within which they had on a reconsideration agreed to give their Father [King George III]."⁸⁶ The reconsideration had been hasty and the map had been scratched or drawn on the stone within twenty-four hours.

The Ojibwas used maps in the course of negotiating the boundaries of reservations on the eastern and northern shores of Lake Huron under the terms of the so-called Robinson-Huron Treaty, signed September 9, 1850. The schedule of reservations attached to that treaty defined seventeen reserves, but in a manner that did not establish definitive boundaries. For instance, the seventeenth was "for Chief Muckatamishaquet and his Band, a tract of land on the east side of the River Naishconteong [Naisoot], near Pointe aux Barils, three miles square; and also a small tract in Washauwenega Bay [Shawanaga Inlet]—now occupied by a part of the Band—three miles square."⁸⁷ Not only were the delineations vague, but so were the units of measurement. Indian Department representative John W. Keating agreed with the representatives of one band that "the league was the measure of length usually used by the Indian people," and the use of miles in the schedule was an error.⁸⁸ As a result, a field survey of each reserve was performed, preceded by a consultation at which the band chief and his people were given an opportunity "to explain more clearly to the officials of the Indian Department the boundaries and extent of the Indian Reserves [as] specified in the 'Schedule of Reservations.'"⁸⁹ The bands were usually well prepared for the negotiations, sometimes with their own maps. At reserve 17, for example, "they had their own 'Indian plan' on birchbark ready to indicate their desire for different areas than those identified in the 'Schedule of

Reservations.'"⁹⁰ Neither the birchbark plan nor a contemporary copy is extant.

A series of five pictographs, two with cartographic elements, appears in Henry Rowe Schoolcraft's *Historical and Statistical Information respecting the History, Condition, and Prospects of the Indian Tribes*.⁹¹ The pictographs, which were carried to Washington in 1849 to petition Congress and President James K. Polk for a permanent home in Wisconsin for the Lake Superior Chippewas, were printed in color from drawings by Seth Eastman. In total the five images depict forty-four persons by their animal totems. The first pictograph (A) (fig. 4.21) represents seven Chippewa chiefs linked together symbolically by eyes and hearts to signify that they see and feel alike about the settlement proposal. The second image with cartographic elements, pictograph (E) (fig. 4.22), clearly shows nine more members of the party associated with the Lac Vieux Desert region on the present Wisconsin-Michigan border. Both images illustrate the importance of cultural context in understanding the meaning and purpose of representations.

BIRCHBARK MAPS

Native Americans inscribed and sometimes painted maps on the inner bark of birch in the northeastern forest region until the mid-twentieth century. Despite the fragility of birchbark, a number of nineteenth-century examples are extant, and many accounts exist from earlier periods.

After serving as a missionary to the Micmacs of the Gaspé Peninsula (now northeastern Quebec) between 1675 and about 1687, Chrétien Le Clercq, a Recollect priest, reported that "they have much ingenuity in drawing upon bark a kind of map which marks exactly all the rivers and streams of a country of which they wish to make a representation. They mark all the places thereon exactly and so well that they make use of them successfully, and an Indian who possesses one makes long voy-

85. Correspondence, Quenepenon, on 1 August 1805, p. 296.

86. Correspondence, Quenepenon, on 2 August 1805, p. 298.

87. *Copy of the Robinson Treaty Made in the Year 1850 with the Ojibewa Indians of Lake Huron Conveying Certain Lands to the Crown* (1939; reprinted Ottawa: Queen's Printer, 1964), 5.

88. David T. McNab, *Research Report: The Location of the Northern Boundary, Mississagi River Indian Reserve #8, at Blind River* (Toronto: Office of Indian Resource Policy, Ontario Ministry of Natural Resources, 17 November 1980; revised 8 March 1984), 11.

89. McNab, *Research Report*, 11.

90. McNab, *Research Report*, 11.

91. Henry Rowe Schoolcraft, *Historical and Statistical Information respecting the History, Condition, and Prospects of the Indian Tribes of the United States*, 6 vols., illustrated by Seth Eastman (Philadelphia: Lippincott, Grambo, 1851–57), 1:416–19. The other three pictographs, depicting the remaining twenty-eight members of the delegation, do not have cartographic elements.

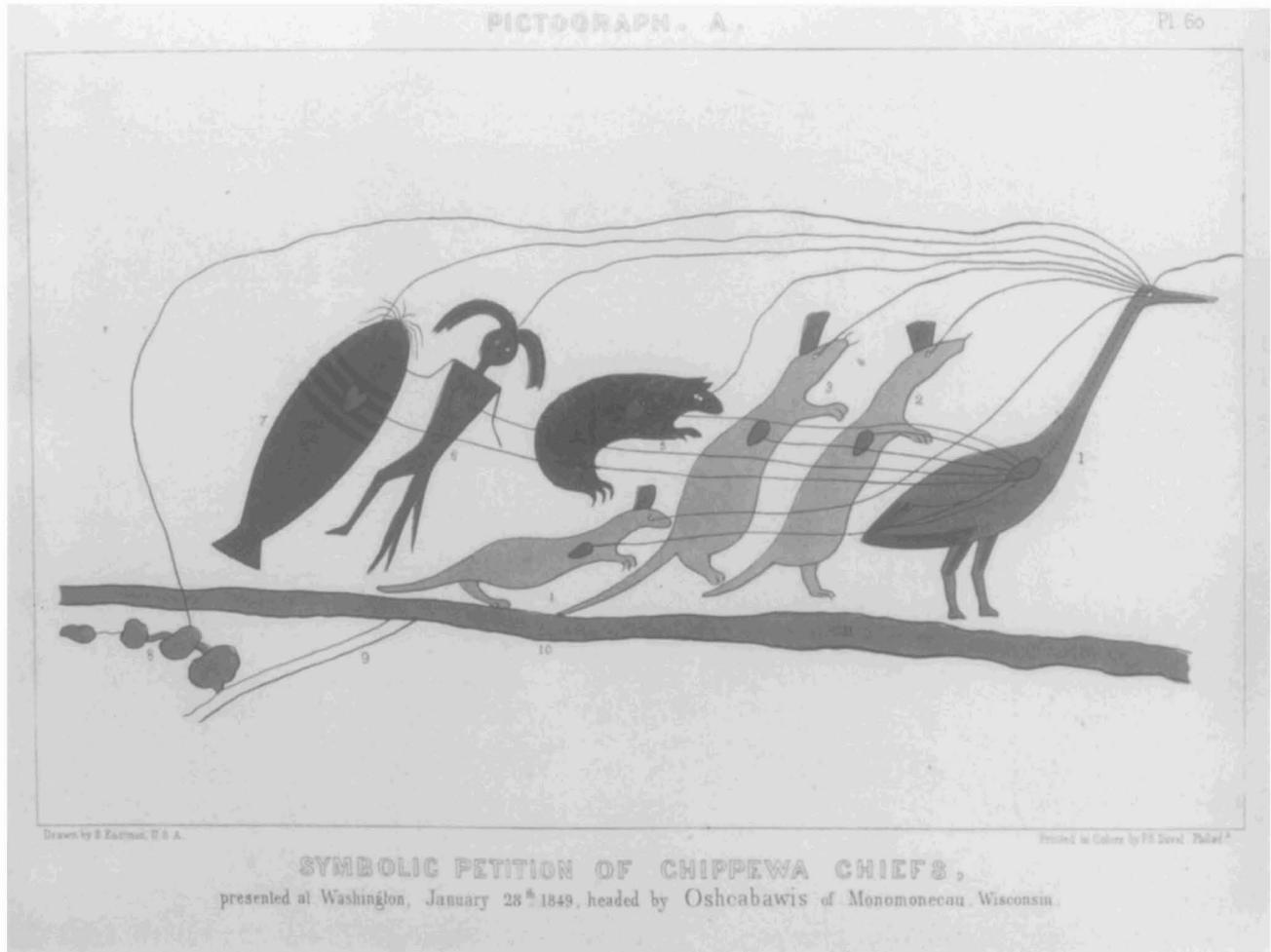


FIG. 4.21. PICTOGRAPH A SHOWING OSHCABAWIS AND OTHER CHIPPEWA CHIEFS. The images of animals—a crane, three martens, a bear, a man-fish (a Chippewa myth), and a catfish—represent the totems of seven Chippewa chiefs taking a land petition to Washington in 1849. The totem of the chief Oshcabawis (of the Crane clan), who headed the party, is connected to a chain of lakes in northern Wisconsin at which wild rice cultivation is proposed (circular images at lower left). The straight-line center represents Lake Superior. Size of the original: 18.6 × 25.2 cm. From Henry Rowe

Schoolcraft, *Historical and Statistical Information respecting the History, Condition, and Prospects of the Indian Tribes of the United States*, 6 vols., illustrated by Seth Eastman (Philadelphia: Lippincott, Grambo, 1851–57), 1:416–17 (description and key) and pl. 60. Photograph courtesy of the State Historical Society of Wisconsin, Madison. Schoolcraft's key is also reproduced in David Turnbull, *Maps Are Territories, Science Is an Atlas: A Portfolio of Exhibits* (Geelong, Victoria: Deakin University, 1989; reprinted Chicago: University of Chicago Press, 1993), 18.

ages without going astray.”⁹² Based on experience in both the St. Lawrence and upper Mississippi Valleys between 1683 and 1692, Lahontan observed that the Indians of the two regions

are as ignorant of *Geography* as of other *Sciences*, and yet they draw the most exact Maps imaginable of the Countries they're acquainted with, for there's nothing wanting in them but the Longitude and Latitude of Places: They set down the True *North* according to the *Pole Star*; The Ports, Harbours, Rivers, Creeks and Coasts, of the Lakes; the Roads, Mountains, Woods, Marshes, Meadows, &c. counting the distances by Journeys and Half-journeys of the Warriors, and al-

lowing to every Journey Five Leagues. These *Chorographical Maps* are drawn upon the Rind of your *Birch Tree*; and when the Old Men hold a Council about War or Hunting, they're always sure to consult them.⁹³

After observing northern Iroquoian Indians to the west of Montreal between 1712 and 1717, the Jesuit mission-

92. Chrétien Le Clercq, *New Relation of Gaspesia: With the Customs and Religion of the Gaspesian Indians*, ed. and trans. William Francis Ganong (Toronto: Champlain Society, 1910), 136.

93. Louis Armand de Lom d'Arce, baron de Lahontan, *New Voyages to North-America*, 2 vols. (London: H. Bonwicke and others, 1703), 2:13–14.

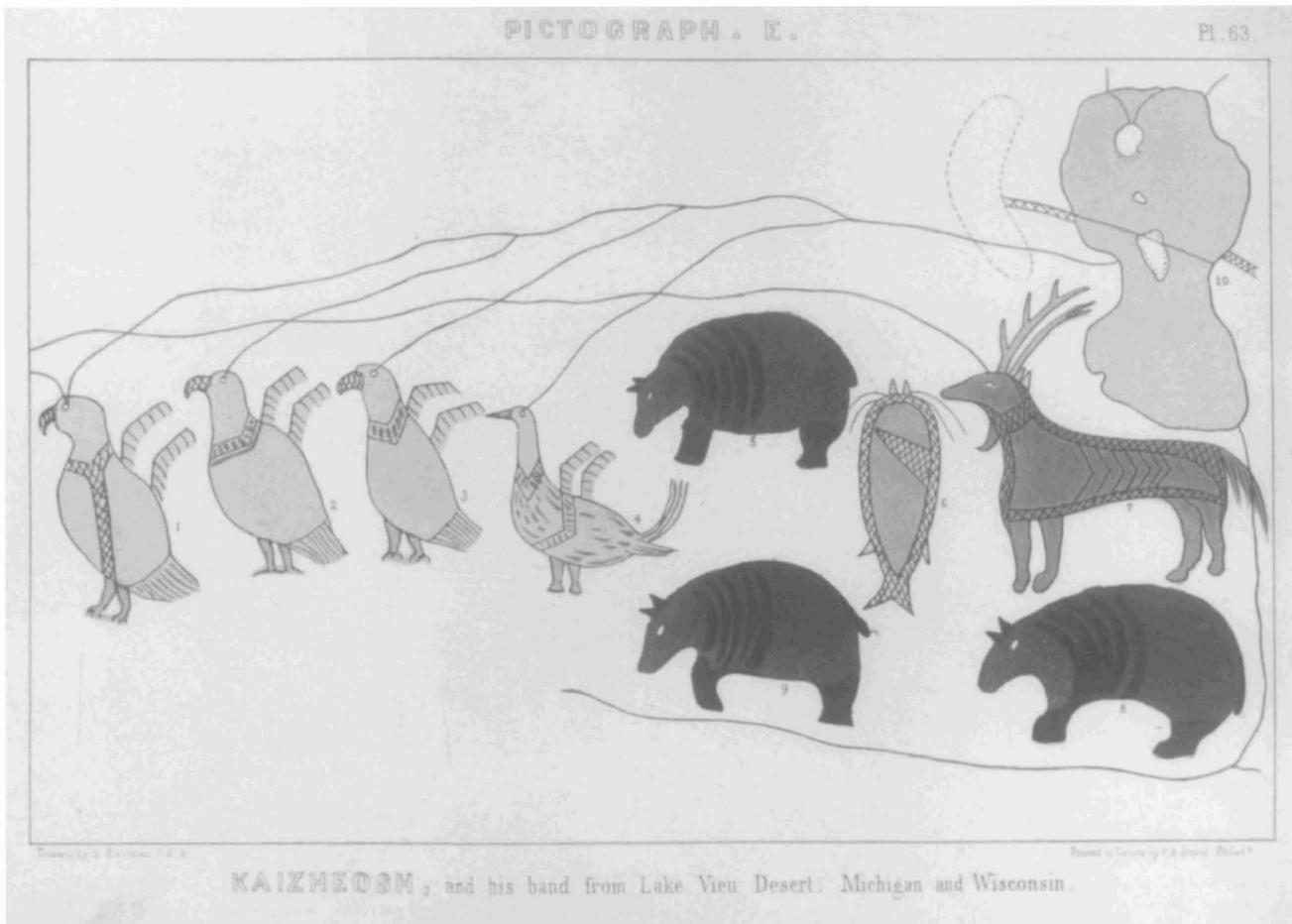


FIG. 4.22. PICTOGRAPH E SHOWING KAIZHEOSH AND HIS BAND FROM LAC VIEUX DESERT, MICHIGAN AND WISCONSIN. Lac Vieux Desert, the source of the Wisconsin River, is shown at top right with the Wisconsin River flowing from it. Draper Island can be easily identified at the east of the lake (east is at the top), and Duck Island is in the center. The lake is linked to three members of the eagle totem and one member of the duck totem, symbolizing their origin with it.

Size of the original: 18 × 26 cm. From Henry Rowe Schoolcraft, *Historical and Statistical Information respecting the History, Condition, and Prospects of the Indian Tribes of the United States*, 6 vols., illustrated by Seth Eastman (Philadelphia: Lippincott, Grambo, 1851–57), 1:419 (description and key) and pl. 63. Photograph courtesy of the State Historical Society of Wisconsin, Madison.

ary Joseph-François Lafitau reached unequivocal conclusions concerning their sense of direction and mapmaking skills. They had “an excellent sense (of direction). It is a quality which seems born in them. . . . They go straight where they wish to go, even in uncharted wildernesses and where no paths are marked. On their return, they have observed everything and trace, grossly, on sheets of bark or on the sand, exact maps on which only the marking of degrees is lacking. They even keep some of these geographical maps in their public treasury to consult them at need.”⁹⁴ European accounts such as Lafitau’s stress the use of birchbark maps as a permanent information resource, a function familiar to Europeans. Indeed, although the circumstances are not well known, some northeastern Indians preserved birchbark and other artifacts in central repositories. Such treasuries included

maps that served as mnemonics of traditions and beliefs, often, though not necessarily, for use in rituals. Responsibility for these artifacts could be vested either in individuals or in groups. Those who made and stored them were powerful individuals within their communities.

Lafitau indicated that the Iroquois stored maps made on birchbark, possibly at Onondaga since it is known that wampum belts, another kind of culturally important artifact, were stored there by the Iroquois Confederacy in the early eighteenth century.⁹⁵ A more detailed description of

94. Joseph-François Lafitau, *Customs of the American Indians Compared with the Customs of Primitive Times*, 2 vols., trans. and ed. William N. Fenton and Elizabeth L. Moore (Toronto: Champlain Society, 1974–77), 2:130.

95. *Council Fire: A Resource Guide* (Brantford, Ont.: Woodland Culture Centre, 1989), 5.

such a repository concerns the Ojibwas. Although not specifically mentioning maps, the Ojibwa chief George Copway described how, in the mid-nineteenth century, his people and most adjacent peoples had

places in which they deposit the records which are said to have originated their worship. The Ojibways have three such depositories near the waters of Lake Superior. Ten of the wisest and most venerable of the nation dwell near these, and are appointed guardians over them.

Fifteen years intervene between each opening. . . . As they are being opened, all the information known respecting them is given to the new members; then the articles are placed before them. . . . if any have begun to decay they are taken out; an exact fac-simile is made and placed in its stead. . . .

These records are written on slate-rock, copper, lead, and on the bark of birch-trees. . . .

The chief of Lac Coart, Oreille, ("Moose Tail,") in the spring of 1836 [reported that]. . . .

. . . the guardians had for a long time selected as the places of deposit the most unsuspected spot, where they dug fifteen feet, and sunk large cedar trees around the excavation. In the centre was placed a large hollow cedar log, besmeared at one end with gum. The open end is uppermost, and in it are placed the records, after being enveloped in the down of geese or swan, which are changed at each examination.⁹⁶

Copway reproduced with explanations approximately seventy of the more than two hundred pictographic characters then in use on Ojibwa artifacts. These included signs for geographical and hydrological features such as seawater, lake, and river (the last two manifestly in plan); islands, and mountains (each in profile); and land (totemically, in the form of a turtle).⁹⁷ Copway did not precisely indicate the origin and use of these records, but they seem to have been related to spiritual beliefs: "The record is said to be a transcript of what the Great Spirit gave to the Indian after the flood."⁹⁸

The material Copway discussed probably included examples of scrolls preserved by the Midewiwin ("grand medicine society") or Mide, an organized priesthood of men and women among the Ojibwas who had occult knowledge of killing and curing. Some of the esoteric knowledge of the society was recorded in pictographs on birchbark scrolls. Analyzing examples held in museums and private collections in many parts of the world, Dewdney identified six categories of scrolls, one of which is the migration scroll, showing the westward diffusion of the Mide religion. According to oral tradition, the beliefs were first brought to Indians on the Atlantic coast. Historical sources record that the Ojibwas had reached Sault Sainte Marie by the mid-seventeenth century, and that after 1780 there were settlements in what is now northern

Minnesota. The scrolls show the route of the diffusion linearly, but distances are not scaled.⁹⁹

In 1966 Dewdney collected a scroll from the shaman Red Sky at Shoal Lake, western Ontario, and was able to discuss its interpretation at the time. Since it has many elements in common with the other migration charts, parts of this interpretation can probably be applied to other examples (fig. 4.23).¹⁰⁰ Because it represented the route by which the Mide religion was believed to have been received, it is best interpreted retrochronologically from west to east, that is, left to right. Even at the left, however, interpretation is difficult, because in addition to the many mythical symbols "the doubly outlined route makes no distinction between land trails or portages and water courses."¹⁰¹ To the east identification becomes even more difficult. However, Dewdney was able to identify features to the east by using lists of names of stopping places preserved orally, which suggests that an oral tradition of toponyms had persisted, preserving meaning longer than the pictographs alone.¹⁰²

Because membership in the Midewiwin was limited and involved a long period of instruction, it is doubtful whether Ojibwas outside the society could understand

96. George Copway, *The Traditional History and Characteristic Sketches of the Ojibway Nation* (London: Charles Gilpin, 1850), 131–33.

97. Copway, *Traditional History*, 134–36.

98. Copway, *Traditional History*, 132.

99. Selwyn Dewdney, *The Sacred Scrolls of the Southern Ojibway* (Toronto: University of Toronto Press, 1975), 57–80 and 183–84. See also G. Malcolm Lewis, "Amerindian Antecedents of American Academic Geography," in *The Origins of Academic Geography in the United States*, ed. Brian W. Blouet (Hamden, Conn.: Archon Books, 1981), 19–35, esp. 26.

In addition to the Mide migration scrolls among the Ojibwas, other nations and groups had similar traditions. For example, a record exists that some believe to be the ancient history of the Delawares (Lenni Lenape), told in the form of an epic migration story. Known from records on bark or wood collected in 1820 and now lost, the Walam Olum, or Red Record, consists of 183 pictographs. Many of them have been interpreted as topographic, including ground level, earth, homeland, body of water, island, an establishment, town, and capital. The work has been interpreted as an ancient narrative of the crossing of the Delawares from Asia into the New World, their journey south and east across North America to a homeland centered in the Delaware River Valley, and ending with a description of European ships arriving on the Delaware River about 1620 (David McCutchen, trans. and annotator, *The Red Record: The Wallam Olum, the Oldest Native North American History* [Garden City Park, N.Y.: Avery, 1993]). However, in 1994 "conclusive textual proof" was published "demonstrating the fraudulence" of the Walam Olum: David M. Oestreicher, "Unmasking the Walam Olum: A 19th-Century Hoax," *Bulletin of the Archaeological Society of New Jersey* 49 (1994): 1–44 (quotations from editor's note, p. 1).

100. Dewdney, *Sacred Scrolls*, esp. 23–36, 57–80. Eight migration scrolls are discussed; although Dewdney saw a ninth, he was not permitted to reveal its contents, aside from some place-names.

101. Dewdney, *Sacred Scrolls*, 61.

102. Dewdney, *Sacred Scrolls*, 68–69.

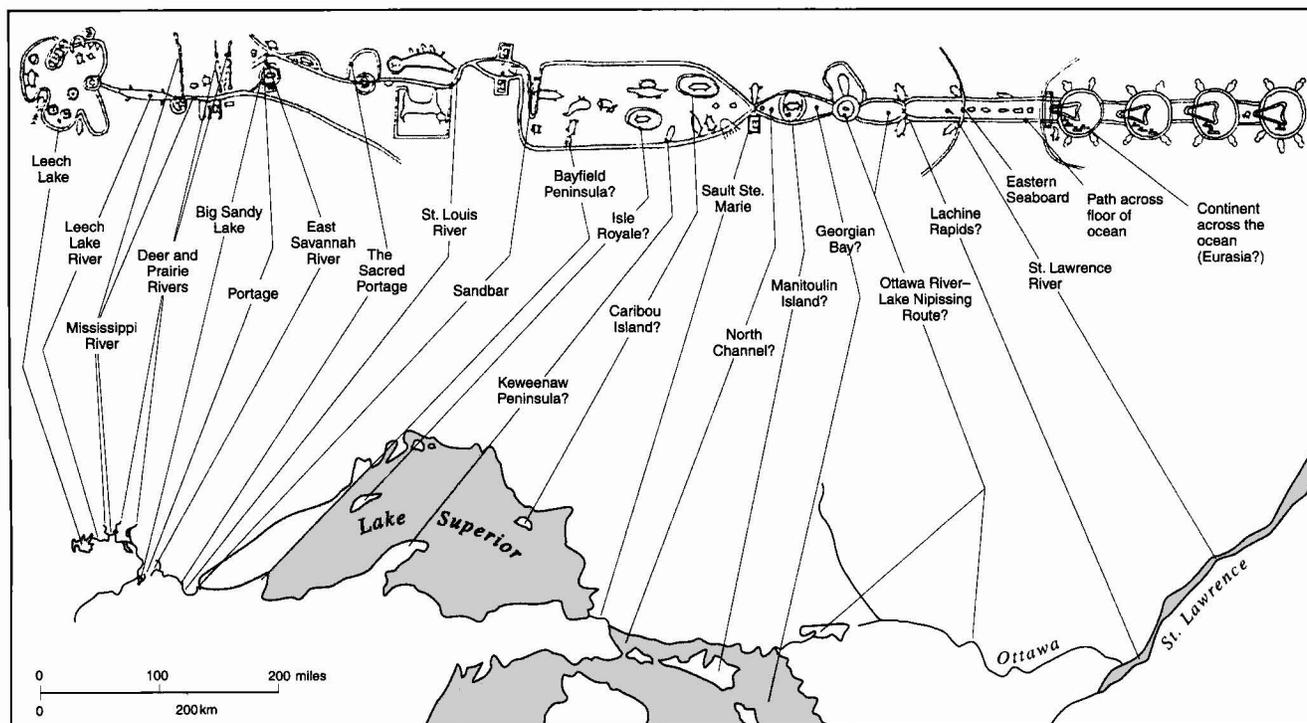


FIG. 4.23. GEOGRAPHICAL INTERPRETATION OF RED SKY'S BIRCHBARK MIGRATION SCROLL. The original scroll is Southern Ojibwa, collected in 1966, but probably a genuine copy in a long tradition. (Permission could not be obtained to reproduce the original.) Such scrolls recorded for posterity the tradition of the route through the St. Lawrence-Great Lakes whereby they received the Mide religion. A drawing of the scroll (top) shows that it is crudely topographical to the left, becoming topological toward the center, and almost cosmographical toward the right. Leech Lake is at the journey's end, including Double and Pine Points, the Leech River, and its drainage into Mud Lake, and then the upper Mississippi. Two rivers not part of the route, the Deer and Prairie,

are shown as snakes. Farther downstream, where the river swings south, the route goes up a small stream to Sandy Lake and leaves the Mississippi basin. A portage must be made into the Great Lakes drainage, probably to the upper Savannah River. The chart is more difficult to follow at this point, but a sandbar at the mouth of the St. Louis River can be clearly identified as the Fond du Lac. In this, as in all the migration charts, Lake Superior is "unmistakably identified," and there is no evidence of any real knowledge of the geography east of Sault Sainte Marie.

Length of the original: 262 cm in six sections. Based on Selwyn Dewdney, *The Sacred Scrolls of the Southern Ojibway* (Toronto: University of Toronto Press, 1975).

the migration scrolls or even knew about them. Furthermore, the society had probably originated in postcontact times as a creative response to changes in relations with the outside world consequent on European encroachment from the east.¹⁰³ If so, the scrolls were indigenous and indirect responses to a major external event.

There are many early historical accounts of Indians' making and using maps on birchbark, but very few of them contain significant information about how the maps were made. However, birchbark has been used as a pictographic medium by native peoples in various parts of the Northern Hemisphere for thousands of years.¹⁰⁴ It is therefore unlikely that techniques have changed significantly in the historic period, so Dewdney's detailed account of techniques used by the Southern Ojibwas in modern times to make their sacred scrolls, including migration scrolls, is significant.¹⁰⁵ The material used for pictographic purposes was the outer bark (phloem) together

with the thin intermediate layer (cambium). It was best stripped in the spring, when the cambium side was coated with a dull yellow to deep brick red deposit. At most seasons of the year the stripped bark rolls up with the cambium side out. In the spring, however, the bark is so flexible that it will adjust its tensions and become essentially flat. The outer side of the bark bleaches in the sun to give a hard, silvery white surface marked with many closely spaced, subparallel, short linear scars (lenticels) caused by

103. See, for example, Lyle M. Stone and Donald Chaput, "History of the Upper Great Lakes Area," in *Handbook of North American Indians*, ed. William C. Sturtevant (Washington, D.C.: Smithsonian Institution, 1978-), 15:602-9, esp. 605-6.

104. "Map Surface, Birchbark," in *Cartographical Innovations: An International Handbook of Mapping Terms to 1900*, ed. Helen M. Wallis and Arthur H. Robinson (Tring, Eng.: Map Collector Publications in association with the International Cartographic Association, 1987), 265-69.

105. Dewdney, *Sacred Scrolls*, 11-22 (note 99).

the natural shedding of small branches. In contrast, the inner surface of the bark is darker and softer, and the lenticels are sealed off, leaving only ripples. Consequently a hardwood, bone, or metal stylus produces fine scratch lines on the outer surface, while the same tool used on the cambium side leaves a deeper, wider, and softer-edged groove. Both sides were used for pictography, but the cambium side appears to have been preferred.¹⁰⁶

Occasionally, red ochre or charcoal mixed with bear's grease (or in later postcontact times, trade colors) was used to highlight particular components of a pictograph. Soft-pencil lines were also used, especially in the nineteenth century. Henry, writing retrospectively about his observations in 1775 in northern Maine, described how "bark, when taken from the tree, may be obtained lengthwise of the tree, from one to four feet, and of a length equal to the circumference," that is, approximately 120 centimeters by perhaps as much as 80 centimeters, although most birchbark maps were considerably smaller.¹⁰⁷

MESSAGE MAPS ON BARK

Some birchbark maps and other maps were used and stored as important ritual and cultural objects, but they also appear to have been made as messages for others. Along trails and navigated waterways, birchbark maps were often inserted into the split end of a stick that had been blazed to attract attention and then driven into the ground, inclined toward the direction of travel being reported or recommended. Directional movements were typically shown by the way a person, animal, or transport vehicle was oriented. Birchbark message maps were used in certain areas until quite recently. Indeed, they may still be used.¹⁰⁸

An account from the American Revolution describes the discovery and use of such a map during Benedict Arnold's 1775 expedition against the British garrison at Quebec. Many years later, John J. Henry recalled that while following the Dead River in Maine

we came to a stream flowing from the west, or rather the northwest. As we were going along in uncertainty, partly inclined to take the westerly stream, one of the party fortunately saw a strong stake which had been driven down at the edge of the water, with a piece of neatly folded birch bark, inserted into a split at the top. The bark, as it was placed, pointed up the westerly stream, which, at its mouth, seemed to contain more water than our true course. Our surprize and attention was much heightened, when opening the bark, we perceived a very perfect delineation of the streams above us, with several marks which must have denoted the hunting camps, or real abodes of the map-maker. There were some lines, in a direction from the

head of one branch to that of another, which we took to be the course of the paths that the Indians intended to take that season. This map we attributed to Natanis, or to his brother, Sabatis, who, as we afterwards knew, lived about seven miles up this westerly stream. . . . Inspecting the map thus acquired, we pursued our journey fearlessly.¹⁰⁹

Sabatis and Natanis probably belonged to the Kennebec dialect group of Eastern Abenakis, who were known to leave such birchbark messages. It is not known whether the message Henry discovered was left deliberately for his group, but the Eastern Abenakis did side with the rebellious colonists in 1775.¹¹⁰

It is possible that the map described above resembled the oldest extant birchbark map, which was mounted, framed, and hence physically protected soon after it was found on the Ottawa River–Lake Huron watershed in 1841, probably shortly after its creation (fig. 4.24). This map reveals some of the technical constraints of working with bark. Birchbark maps tend to rectilinearity, because in making long, curved lines the stylus would get caught in the lenticels.¹¹¹ There are a few long, smooth curves,

106. Regional differences may also have existed. For example, Dewdney noted that Indians around and beyond the upper Great Lakes preferred to use the cambium side of bark but that, for an unknown reason, the Indians around Lake Winnipeg preferred the outer surface; Dewdney, *Sacred Scrolls*, 16.

107. John Joseph Henry, "Campaign against Quebec," reprinted in *March to Quebec: Journals of the Members of Arnold's Expedition*, comp. and annotated Kenneth Roberts (New York: Doubleday, Doran, 1938), 295–430, esp. 311. A Mide migration chart of unknown provenance, hung on the wall of a storage room on the fifth floor of the American Museum of Natural History, New York, consists of three approximately equal sections stitched together, with an overall length of 260 centimeters; see Dewdney, *Sacred Scrolls*, 66–67 and 183.

108. Nicholas N. Smith, of Ogdensburg, New York, gave me a color transparency of a Mistassini Cree birchbark map he found attached to a tree in 1970 at a point where, shortly before, an old trail intersection had been crossed by a new gravel road.

To better appreciate such messages one should be aware that the hunting patterns of the people were well established and known. . . . Before the Indians left for their winter camps the hunters met at the Trading Post letting the chief trader or factor know where and when they would be at each of their camps during the winter. . . . Times when neighbors would visit were established. It was important for the hunters to know when visitors were coming so that they could plan their busy hunting schedule and not take days off needlessly. . . . If hunting conditions were not good forcing a group to make an unanticipated move, it was very important for any change in plan to be communicated. The birch bark message was the means of letting the "world" know "one's" whereabouts or change in plan. (Nicholas N. Smith, personal communication, 2 November 1994.)

For general reference, see Mallery, "Picture Writing," 329–40 (note 4).

109. Henry, "Campaign against Quebec," 314–15 (note 107).

110. Dean R. Snow, "Eastern Abenaki," in *Handbook of North American Indians*, ed. William C. Sturtevant (Washington, D.C.: Smithsonian Institution, 1978–), 15:137–47, esp. 144.

111. Dewdney, *Sacred Scrolls*, 17 (note 99).

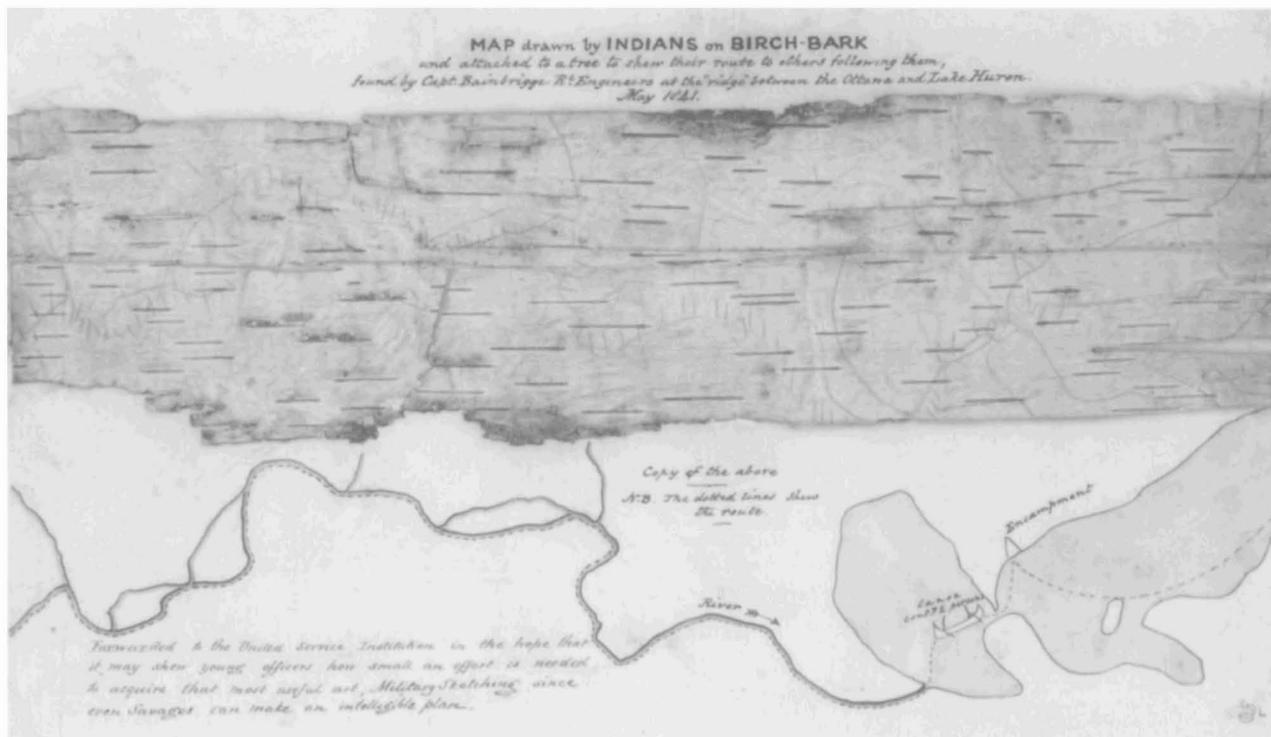


FIG. 4.24. POSSIBLY THE OLDEST EXTANT MAP ON BIRCHBARK. Probably Ojibwa. An inscription on the paper the map was mounted on reads: "Map drawn by Indians on birch-bark and attached to a tree to shew their route to others

following them, found by Capt. Bainbrigg R¹. Engineers at the 'ridge' between the Ottawa and Lake Huron. May 1841." Size of the original: 10 × 38 cm. By permission of the British Library, London (Map Library, RUSI [Misc.], fol. 2).

but they avoid lenticels; the river is composed of several straight sections with angular intersections, and the many short hatched lines are approximately at right angles to the lenticels, though avoiding them wherever possible.

Maps drawn on birchbark with charcoal or pencil tend to be less constrained by lenticels and ripples. A mid-nineteenth-century map of the Rangeley Lakes region in northeastern Maine appears to have been drawn on the cambium side of bark with a mixture of charcoal and bear grease (fig. 4.25). Without exception, the linework is bold and, except for short straight lines in a symbol representing portages, is made up almost exclusively of curves. Furthermore, the ripples are never avoided and are intersected at all angles.

Although in the examples just discussed the map was the dominant element, more frequently maps were a small part of the pictographic message. An example is the Ojibwa message on birchbark described by Henry Rowe Schoolcraft in 1820 near Kettle River (now in eastern Minnesota):

On quitting our encampment this morning, the Indians left a memorial of our journey inscribed upon bark, for the information of such of their tribe as should happen to fall upon our track. This we find to be a common custom among them. It is done by tracing, either with paint or with their knives upon birch

bark, (*betula papyracea*) a number of figures and hieroglyphics which are understood by their nation. This sheet of bark is afterwards inserted in the end of a pole, blazed, and drove into the ground, with an inclination towards the course of travelling. In the present instance the whole party were represented in a manner that was perfectly intelligible, with the aid of our interpreter, each one being characterized by something emblematic of his situation or employment. . . . The figure of a tortoise and prairie hen, denoted that these had been killed, . . . three hacks upon the pole, leaning N.W. [denoted] that we were going three days N.W. . . . Should an Indian hereafter visit this spot, he would therefore read upon this memorial of bark [among many other things] that they were going to Sandy Lake, (knowing three days journey N.W. must carry us there).¹¹²

At its most sophisticated, pictography could be extremely complicated but remarkably precise.¹¹³ Based on

112. Henry Rowe Schoolcraft, *Narrative Journal of Travels through the Northwestern Regions of the United States* (Albany: E. and E. Hosford, 1821), 211–12. Schoolcraft contrasted this with a map of part of the coast of Lake Superior drawn by "one of the lake Indians," because the former was "a historical record of passing events" (213).

113. Pictography could also be used to express quantitative information. See, for example, Father Paul Le Jeune's description in the *Jesuit Relations* for 1637 of an Iroquois message painted on a plank that had



FIG. 4.25. MAP ON BIRCHBARK OF THE RANGELEY LAKES REGION, MAINE. Drawn on one sheet of birchbark for the Bangor doctor Elijah L. Hamlin by his Indian (probably Eastern Abenaki) guide in the mid-nineteenth century. Unlike the Ojibwa birchbark example of the Ottawa River (fig. 4.24), this was not engraved but drawn, probably with the traditional mixture of charcoal and bear's grease.

Size of the original: ca. 81 × 51 cm. Photograph courtesy of Hamlin Memorial Library, Paris, Maine.

his experience with the Ojibwas in the headwaters region of the Mississippi River in 1836–37, Joseph N. Nicollet gave a detailed account of the type of pictography (which he called “figurative language”) used when “they travel or hunt or wage war in order to make known their whereabouts and the events they witnessed, to show where they came from, where they are heading, and what they plan to do, and to tell of the things they saw, etc. They mark all these things at the confluence of rivers, on lake shores, on portage trails, always in the most conspicuous places, along the paths traveled most by passersby who are carriers of these dispatches.”¹¹⁴ Nicollet included examples of birchbark messages left at such points, for which Ojib-



FIG. 4.26. DRAWING OF THE PICTOGRAPHIC CONTENT OF A KIKAIGON WITH A LINEAR SPATIAL STRUCTURE. Ojibwa, 1836–37. “The bear and eelpout [full-size male with bear totem and breasted female with fish totem] three nights ago [three short strokes to left] left a son and daughter [small and very small figures, each with its totem] in their lodge [crude conical tipi at extreme left with external poles holding down hides] and took a son with them [very small figure between parents with its own bear totem]. They went to the two lakes [represented in stereotyped plan with tributaries at the extreme right] where they are drying the meat [on a frame to left of the lakes] of a deer killed by the husband [between the adult male figure and the drying frame].” Joseph N. Nicollet, *The Journals of Joseph N. Nicollet: A Scientist on the Mississippi Headwaters, with Notes on Indian Life, 1836–37*, trans. André Fertey, ed. Martha Coleman Bray (St. Paul: Minnesota Historical Society, 1970), 269. Although the sequence is spatial there is no attempt here to indicate relative distance or unique topographical features. The pair of lakes appears to be stylized—there were thousands in the region.

Size as reproduced: 3.5 × 10.0 cm. Photograph courtesy of the Library of Congress, Washington, D.C.

was had a noun: *kikaigon*, “a mark, an inscribed bark giving information,” derived from the verb *kikaigem*, “to mark something, to inscribe a bark, or also to indicate or say where one is going, to communicate news, etc.”¹¹⁵ Although a high proportion of *kikaigon* have a spatial component to their message, they tend to emphasize historical events. One example (fig. 4.26) was interpreted by Nicollet.¹¹⁶

been torn from a Christian cross, depicting the heads of thirty captured Hurons. The figures were intended to communicate a great deal of quantitative and qualitative information, using repetition of figures to indicate number, different colors and size variations to denote categories, and ornamentation (the “plumes” were probably totems) to show particular cases (Reuben Gold Thwaites, ed., *The Jesuit Relations and Allied Documents: Travels and Explorations of the French Jesuit Missionaries among the Indians of Canada and the Northern and Northwestern United States, 1610–1791*, 73 vols. [Cleveland: Burrows Brothers, 1896–1901], 12:215). The same techniques were probably used frequently on maps, though transcribers did not always appreciate their significance and details may not always have been copied faithfully.

114. Joseph N. Nicollet, *The Journals of Joseph N. Nicollet: A Scientist on the Mississippi Headwaters, with Notes on Indian Life, 1836–37*, trans. André Fertey, ed. Martha Coleman Bray (St. Paul: Minnesota Historical Society, 1970), 266.

115. Nicollet, *Journals*, 275.

116. See also the three birchbark *wikhegan* discussed on p. 173.

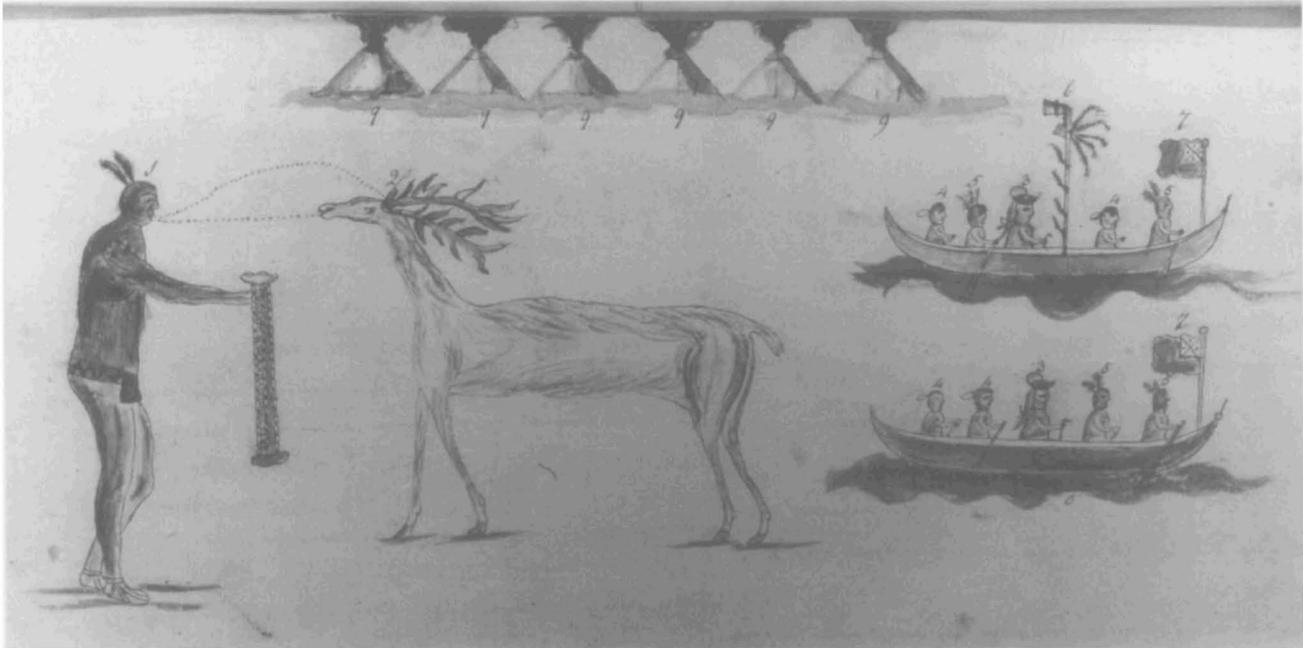


FIG. 4.27. COPY OF A CHIPPEWA PAINTING ON A BLAZED TREE, 1767. Copied by Jonathan Carver from the original drawn or painted with charcoal mixed with bear's grease on the white outer sapwood of a conspicuously-located

tree. The copy differs from the account of the original in showing two canoes and positioning them to the right. By permission of the British Library, London (Add. MS. 8950, fol. 169).

MAPS ON BLAZED TREES

Another form of message map used in the heavily forested Northeast was painted or drawn on the exposed wood of trees whose inner and outer bark had been stripped away. A conspicuous tree on the route was blazed so the mark would be seen as the intended recipients of the message arrived.

Hugh Jones, reporting on his experience in tidewater Virginia between 1717 and 1721, wrote that the Indians

have certain hieroglyphical methods of characterizing things; an instance of which I have seen upon the side of a tree where the bark was taken off.

There was drawn something like a deer and a river, with certain strokes and dashes; the deer looking down the river, which we interpreted to be left for information to some of their stragling company, that certain of them were gone down that river a hunting, and others were gone different ways.¹¹⁷

Paintings and drawings on blazed trees rarely if ever equaled the maplike characteristics of certain birchbark maps. At best they indicated direction of movement, relative position, and perhaps spatial linkage. Jonathan Carver described and explained the making of one in 1767 on the Chippewa River, just above its confluence with the Mississippi (fig. 4.27). His guide was a Chippewa, to whose territory they were moving upstream. They were still, however, in the territory of the Dakota

Sioux, enemies of the Chippewa. The guide had been appointed with the full agreement of the Sioux. To inform any members of the Sioux who were unaware of that agreement,

he [the Chippewa guide] peeled the bark from a large tree near the entrance of a river, and with wood-coal mixed with bear's-grease, their usual substitute for ink, made in an uncouth but expressive manner the figure of the town of the Ottagaumies [the Fox settlement, where Carver had spent several weeks]. He then formed to the left a man dressed in skins, by which he intended to represent a Naudowessie [Dakota Sioux], with a line drawn from his mouth to that of a deer, the symbol of the Chipéways. After this he depicted still farther to the left a canoe as proceeding up the river, in which he placed a man sitting with a hat on; this figure was designed to represent an Englishman, or myself, and my Frenchman was drawn with a handkerchief tied round his head, and rowing the canoe; to these he added several other significant emblems, among which the Pipe of Peace appeared painted on the prow of the canoe.

The meaning he intended to convey to the Naudowessies, and which I doubt not appeared perfectly intelligible to them, was, that one of the Chipéway chiefs [i.e., the guide-message maker himself] had re-

117. Hugh Jones, *The Present State of Virginia . . . From Whence Is Inferred a Short View of Maryland and North Carolina* (London: J. Clarke, 1724), 16–17.

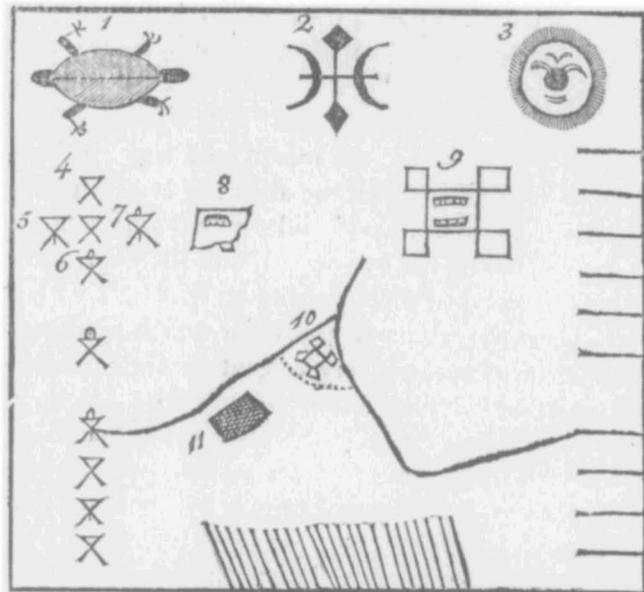


FIG. 4.28. AN EARLY EXAMPLE OF A LINE ENGRAVING CONTAINING AN INDIAN MAP. The original was painted on a blazed tree by the Muskingum River (southeastern Ohio), and the information it contained dates from 1781 or earlier. Apparently representing the exploits of a Delaware warrior, only parts 8–11 are cartographic: (1) imitation of a river turtle distinguishing this group (the Delawares are divided into three groups, whose emblems are the turtle, the wolf, and the eagle); (2) personal mark or character of the maker; (3) meant for the sun; the ten horizontal lines under it, running down the right side, show the number of times the maker had been at war (on expeditions); (4) men's scalps taken; (5) women's scalps taken; (6) men prisoners taken; (7) women prisoners taken (the scalps and prisoners are situated across from the war expedition in which they were taken; e.g., on his first expedition (first horizontal line) he took none, on his second he took one, on his third he took three); (8) unknown small fort; (9) Fort Detroit; (10) Fort Pitt at the confluence of the Allegheny and Monongahela Rivers forming the Ohio River; and (11) Pittsburgh.

From William Bray, "Observations on the Indian Method of Picture-Writing," *Archaeologia* 6 (1782): 159–62, esp. 159.

ceived a speech from some Naudowessie chiefs at the town of the Otagaummies, desiring him to conduct the Englishman, who had lately been among them, up the Chipéway river; and that they thereby required, that the Chipéway, notwithstanding he was an avowed enemy, should not be molested by them on his passage, as he had the care of a person [Carver] whom they esteemed as one of their nation.¹¹⁸

Sometime before 1781, "a gentleman" described a drawing made by a Delaware Indian on a blazed tree, including somewhat more detail on the production process than was given by Carver. He reported

that he found the marks on a tree on the banks of the Muskingham [Muskingum] river; that he does not certainly recollect of what species the tree was, but thinks

it was a sugar maple; that the bark was peeled off on one side of the tree, about a foot square, and these characters painted on that part with charcoal and bear's oil; that black is the color which signifies anger or war; that there is nothing very elegant in their paintings, the end of the finger, or the point of a burnt stick, being the only pencil they use; that this was the performance of Wingenund, an Indian warrior of the Delaware nation, when going out to war. . . .

He says that the marks they make on their return are generally done with vermilion, which is a peaceable color, and shews that their anger is no more.¹¹⁹

The drawing was a composite of pictographic statements concerning its maker's military record (fig. 4.28). Four of the pictographic components were indicated by the Delaware chief White-Eyes to be schematic plans: an unknown small fort,¹²⁰ Fort Detroit, Fort Pitt, and Pittsburgh. The identity of the last two is in no doubt because they are at the confluence of two rivers (the Monongahela and Allegheny; unnumbered but named Moningalialy and Alligany by White-Eyes) to form a third (the Ohio). Furthermore the line representing the Allegheny River has a distinctive bend, indicating the elbow in that river downstream from what is now Rimer, Pennsylvania.

WAMPUM MAPS

In northeastern North America, highly stylized maps were incorporated in mnemonic devices known as wampum belts. The word wampum was derived from the eastern Algonquian *wampumpeage*, white beads made from shell. Originally fashioned from freshwater shells, by the early eighteenth century white beads were almost exclusively made from any of several species of marine shells, whereas the only source of purple (or "black") wampum was the quahog clam. In the fur trade years, wampum became a trade item. The Europeans took it inland from the coast, and demand became so great that factories were established on Long Island and in New Jersey. Much of the increase in demand was generated by the Iroquois, who

118. Jonathan Carver, *Travels through the Interior Parts of North America in the Years 1766, 1767 and 1768*, 3d ed. (London: C. Dilly, 1781), 418–19.

119. William Bray, "Observations on the Indian Method of Picture-Writing," *Archaeologia* 6 (1782): 159–62, esp. 160–61.

120. White-Eyes thought it might have been one of the small forts on Lake Erie that was surprised by the Indians about 1762. Gregory A. Waselkov, University of South Alabama, said that it reminded him of Fort Loudon (1756–60) on the Little Tennessee River in the Cherokee country (personal correspondence, July 1993). The arrangement of the known places and features is topologically correct. If the positioning of the unknown fort was intended to conform to that arrangement, then it could not have been on Lake Erie but must have been somewhere south of the Ohio River. At that period Fort Loudon was the only fortified military post in that direction.

wove the wampum on sinew “into belts with particular designs to serve as mnemonic devices to recall a specific treaty or agreement. Wampum was at once the witness to a pledge and the pledge itself, a living record that bound the participants to their words as it helped them to recall their promises.”¹²¹

The earliest unambiguous reference to a wampum map is in Father François Le Mercier’s relation from Quebec for the years 1652 and 1653. He described how, in the course of a council, an elderly Iroquois “ambassador” spoke of his people’s affection for the Algonquins at Sillery, Quebec. This was symbolized by presents, some of them “porcelain collars of great size.” Taking one of these,

he stretched it out in the middle of the room, and said: “Behold the route that you must take to come and visit your friends.” This collar was composed of white and violet-colored porcelain [shell], so arranged as to form figures, which this worthy man explained after his own fashion. “There,” said he, “are the lakes, there the rivers, there the mountains and valleys that must be passed; and there are the portages and waterfalls. Note everything, to the end that, in the visits that we shall pay one another, no one may get lost.”¹²²

This would become known as a road or alliance belt. Most were considerably less geographical than the Iroquois belt appears to have been.

A road belt was used by a Cherokee captain in Philadelphia in 1758 at a meeting with representatives of the Iroquois. Both supported the British. In the course of a speech expressing friendship “he took out a Belt of Nine Rows, with Three Figures of Men wrought in it, one at each End and one in the middle, and a Row of black from one End to the other.” In the course of his speech the Cherokee captain told the Iroquois,

We have made a Road for you, and we will endeavour to keep that Road clear for our Brothers to walk in, in hopes that you will come and make use of that Road; but if any of the Children of the French [Indian allies of the French in the Ohio Valley, including the Delawares, Shawnees, and Wyandots] make use of our Road, or throw any obstructions in the Way we will certainly kill them.¹²³

The Cherokee captain identified the man on the end of the belt as the king of the Iroquois and the middle figure as the Kiowee king. This probably refers to Keewhoee, a Cherokee town in North Carolina, probably the captain’s home, near British colonial settlements. The Kiowee king, reported the captain, said, “I have cut down all the Trees and moved away all the Stones out of your Way that you may come to my Town; likewise the Road is cleared from my Town to the Indian Town Chotta [another Cherokee

town, remoter from the British, and in the heart of the Appalachian Mountains] for your Messengers to come to us, and tell us the News; and they may go safe from Town to Town.”¹²⁴ The road described is stylized and metaphorical and ignores geographical and geopolitical complexities. The three locations represented by the diamonds were geographically neither equidistant nor on the same axis, and the region between the Iroquois and Cherokee homelands was dominated by allies of the French, enemies to both.

Perhaps the best-known examples of wampum symbolizing both geopolitical and spatial relationships were the “Five Nations” belts. The territories of the five nations of the League of the Iroquois—Mohawks, Oneidas, Onondagas, Cayugas, and Senecas—were linked by the natural routeway afforded by the Mohawk Valley and bench at the base of the Niagara escarpment. “Once the League was established, certain people were designated to commit to memory the laws of the Great Peace, the constitution and history of the League. Wampum records were created to assist their memories and were stored at Onondaga, the geographic and political centre of the Confederacy.”¹²⁵ The Five Nations war belt was probably made to serve as a mnemonic of the pre-Confederacy era, when the five nations were frequently at war with each other: five paired diamonds on a dark background (fig. 4.29). A red pigment was applied to each of the diamonds to represent war, and the absence of a linking device reinforced their separateness. In contrast, the Five Nations peace belt in figure 4.30 originally showed five equally spaced human figures in white on a purple background. The five figures were represented as holding hands, but with their elbows crooked to indicate that any of the nations could leave the Confederacy, though not without weakening it and leaving its protection.¹²⁶

Although the overall symmetry of wampum belts was not an inevitable consequence of the medium, the characteristic style was. The beads were small cylinders, with length normally two to four times the diameter. Hence when different colored beads were threaded to make dark-on-light or light-on-dark patterns, shapes were defined by essentially straight lines intersecting at angles. Furthermore, the length of a belt was characteristically five to fifteen times its width.

In the early and middle eighteenth century, French and British civil and military officials encouraged the two-way

121. *Council Fire*, 2 (note 95).

122. Thwaites, *Jesuit Relations*, 40:203–5 (note 113).

123. Recorded in William Johnson, *The Papers of Sir William Johnson*, 14 vols. (Albany: University of the State of New York, 1921–65), 2:861.

124. Johnson, *Papers*, 2:861.

125. *Council Fire*, 5 (note 95).

126. *Council Fire*, 5.

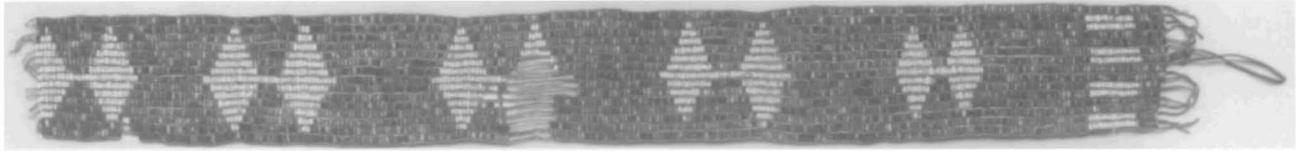


FIG. 4.29. FIVE NATIONS WAR BELT. Iroquois, unknown date. Wampum was not an appropriate medium for maps, except as stylized mnemonics. In this case the five double diamonds are believed to represent the east-west alignment of the Five Nations territories at a time when they were at war with

each other: from right to left, Mohawks, Oneidas, Onondagas, Cayugas, and Senecas. Red on each of the five diamonds indicates war.

Size of the original: 11.5 × 103 cm. Photograph courtesy of the Woodland Cultural Centre, Brantford, Ontario.

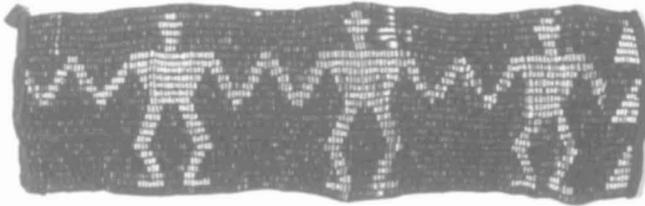


FIG. 4.30. FIVE NATIONS PEACE BELT. Iroquois, unknown date. Before it was damaged, there were five figures holding hands. They represented the same geographical sequence of Five Nations as in the war belt (fig. 4.29), but after the alliance arising from the Iroquois Confederacy. Photograph courtesy of the Royal Ontario Museum, Toronto (ROM #937.39.1).

what power they were of, how allied, what enemies they had, and the like of which in his proper place.”¹³⁰ The skyline profile had much in common with those made by English mariners for identifying coastlines and their hazards.¹³¹ The very poorly written and apparently phonetically spelled text, not to mention the written date of 1607, suggests that, if the piece is an Indian artifact, it was made under rapid acculturation.

Another skin map of uncertain provenance is of the Wabash Valley, embracing much of what is now Indiana and southern and central Illinois (fig. 4.32).¹³² Taken to England as a curio in 1825, it has always been known as “an Indian map on skin” but without authentication. It

use of belts in the course of their dealings with the Indians of the Northeast. They were convenient symbols of trust and mnemonics of agreements. Indeed, the British preserved the belts that had been presented to them.¹²⁷ However, the use of wampum declined by the late 1700s. It became harder to obtain, and Indian leaders found writing a more precise form of communication. British authorities became less familiar with the use of wampum, and the Americans prohibited the belts and other symbols of Indian sovereignty and independence.¹²⁸

MAPS ON SKIN

Animal skins of various kinds were available to all Native North Americans. In the Northeast, however, maps on skin are rarer, either as artifacts or in accounts, even though skin would presumably be more durable. One possible extant example is what appears to be a skyline profile of part of the coast of Maine as seen from the sea, perhaps that controlled by the chief whose legs bestride it, supposedly made in 1607 (fig. 4.31).¹²⁹ If authentic, it would constitute the only known Indian-made cartographic artifact from the seventeenth century. Even if verified, however, it obviously reflects considerable European influence, possibly having been made by Skidwarres, one of three Abenakis whom Ferdinando Gorges said he made “able to set me downe what great Rivers ran up into the Land, what Men of note were seated on them,

127. “The Command^r Room in the Forts where conferences are held, & where all the belts which the Indians deliver are hung up,” Johnson, *Papers*, 3:454n (note 123).

128. *Council Fire*, 19 (note 95).

129. Formerly thought by its owner to be an Indian map of the James River, Virginia; Frank H. Stewart, “Jamestown, Virginia, Indian Document of May 1607, Reminder of Capt. John Smith, Found in Hadsonfield,” *Haddon (N.J.) Gazette*, 15 February 1945, 2.

130. Ferdinando Gorges, *A Briefe Narration of the Originall Undertakings of the Advancement of Plantations into the Parts of America* (London: E. Brudenell for N. Brook, 1658), 4.

131. For example, one of three manuscript versions of William Strachey’s *The Historie of Travaile into Virginia Britannia* (1612), British Library, London (Sloane MS. 1622), contains several examples of such profiles. They were probably transcripts or traced from similar ones in James Davies’s *The Relation of a Voyage into New England*, describing the voyage of 1607–8 in which Skidwarres, the probable painter of the skin, was returned from England to Maine. Unfortunately, only a later transcript of the latter exists: the William Griffith copy, Lambeth Palace Library, London (MS. 850).

132. G. Malcolm Lewis, “An Early Map on Skin of the Area Later to Become Indiana and Illinois,” *British Library Journal* 12 (1996): 66–87. The initials H. B. on the back (burned?) probably indicate that it was owned and perhaps made by Hypolite Bolon, a longtime resident of Fort Vincennes who was, or was to become, an Indian interpreter. Later moving to St. Louis, from where the map was eventually taken to England, he probably had an early formal education and wrote well. Years later he was said to speak “several languages of the Mississippi tribes,” the only interpreter in St. Louis capable of doing so, and in that capacity he received from the United States government “200 dollars a year and his firewood”; Colonel Charles Dehault Delassus to Captain Amos Stoddard, St. Louis, 6 March 1804; see also Frederic L. Billon, comp., *Annals of St. Louis in Its Early Days under the French and Spanish Dominations* (St. Louis, 1886), 370–71.

was almost certainly made in 1775 in connection with negotiations by the Wabash Land Company at Post Vincennes to purchase land from the Piankashaws. The pattern of rivers and trails is unlike that on any known European map of the region at the time (see fig. 4.33). Indeed, it has many of the characteristics of the Catawba, Chickasaw, and, to a somewhat lesser extent, Chipewyan maps discussed below. In contrast, the fineness of the inscribed linework is like that on known Euro-American maps made on skin,¹³³ and it is very unlikely that the neat hand of the names and inscriptions could have been that of a Wabash Valley Indian about 1775.

In 1762 a Delaware religious prophet (known as Neolin, the Enlightened One) in the upper Ohio Valley used as a visual aid a cosmographical map drawn on a dressed deerskin.¹³⁴ He ended each of his orations with the following: “‘And now, my friends, in order that what I have told you may remain firmly impressed on your minds, and to refresh your memories from time to time, I advise you to preserve, in every family, at least, such a book or writing as this, which I will finish off for you, provided you bring me the price, which is only one buck-skin or two doe-skins a piece.’”¹³⁵ The Delaware speaker, who was widely influential in the early 1760s, assumed that all who heard him and members of “every family” could understand his cosmographical map.

Although no copy of the map survives, Heckewelder’s detailed description allows it to be reconstructed (fig. 4.34):

An inside square was formed by lines drawn within it, of about eight inches each way, two of those lines, however, were not closed by about half an inch at the corners. Across these inside lines, others of about an inch in length were drawn with sundry other lines and marks, all which was intended to represent a strong inaccessible barrier, to prevent those without [i.e., in the terrestrial world] from entering the space within, otherwise than at the place appointed for that purpose. . . . In explaining or describing the particular points on this map, with his fingers always pointing to the place he was describing, [the preacher] called the space within the inside lines “the heavenly regions,” or the place destined by the great Spirit for the habitation of the Indians in future life; the space left open at the south east corner, he called the “avenue,” which had been intended for the Indians to enter into this heaven, but which was now in the possession of the white people; wherefore the great Spirit had since caused another “avenue” to be made on the opposite side, at which, however, it was both difficult and dangerous for them to enter, there being many impediments in their way, besides a large ditch leading to a gulf below, over which they had to leap; but the evil spirit kept at this very spot a continual watch for Indians, and whoever he laid hold of, never could get away from him again, but was carried to his regions. . . .



FIG. 4.31. POSSIBLE PROFILE OF PART OF THE COAST OF MAINE. Drawing in red on skin, “Moi [May?] 1607.” Probably painted in that year in England by one or more Abenakis.

Size of the original: 33 × 38 cm. Photograph courtesy of the Stewart Collection, College Library, Rowen College of New Jersey, Glassboro.

The space on the outside of this interior square, was intended to represent the country given to the Indians to hunt, fish and dwell in while in this world; the east side of it was called the ocean or “great salt water Lake [the Atlantic Ocean].” Then the preacher, drawing the attention of his hearers particularly to the south east avenue, would say to them. “Look here! See what we have lost by neglect and disobedience; by being remiss in the expression of our gratitude to the great Spirit, for what he has bestowed upon us; by neglecting to make to him sufficient sacrifices; by looking upon a people of a different colour from our own, who had come across a great lake [the English, who had arrived via the Atlantic Ocean], as if they were a part of ourselves; by suffering them to sit down by our side, and looking at them with indifference, while they were not

133. For example, a cadastral map on goatskin, formerly rolled around a wooden dowel, shows lands sold and for sale in Groton and Hebron Townships, Grafton County, New Hampshire, in the late eighteenth century. Based in part on a land survey, the control points are pricked, the boundaries of lands sold and for sale are straight and finely scribed, and other details are in ink. Geography and Map Division, Library of Congress (C 3 Vault Shelf, G 3744. G 78 G 45 18–). Given the importance of saddlery and cobbling in frontier societies, there may have been a tradition of cadastral mapping on leather in the eighteenth century.

134. See Arlene B. Hirschfelder and Paulette Fairbanks Molin, *The Encyclopedia of Native American Religions: An Introduction* (New York: Facts on File, 1992), 66.

135. John Gottlieb Ernestus Heckewelder, *An Account of the History, Manners, and Customs, of the Indian Nations, Who Once Inhabited Pennsylvania and the Neighbouring States*, Transactions of the Historical and Literary Committee of the American Philosophical Society, vol. 1 (Philadelphia: Abraham Small, 1819), 1–348, esp. 290.

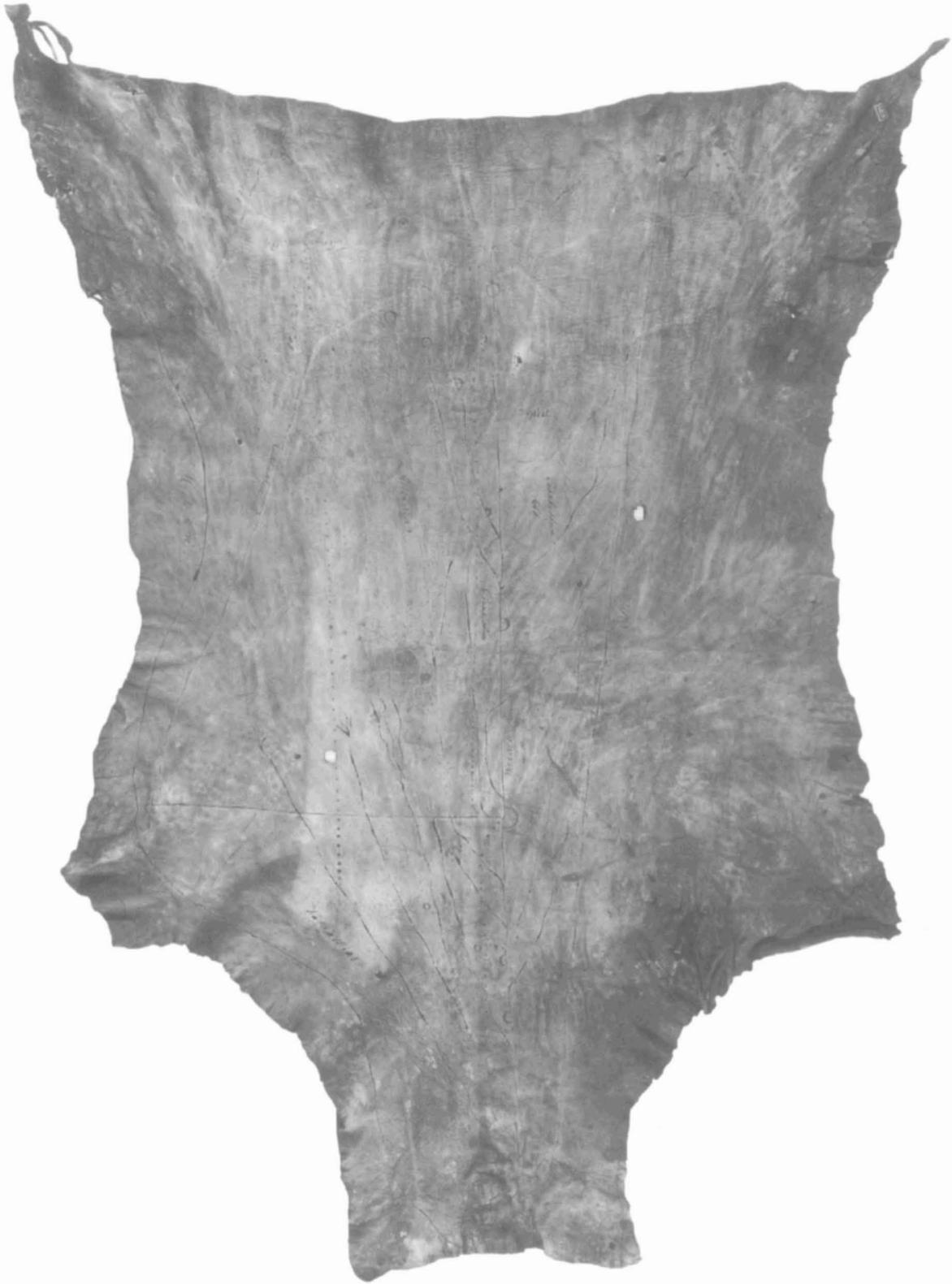


FIG. 4.32. MAP ON SKIN, WITH INDIAN CHARACTERISTICS, OF THE WABASH AND ADJACENT VALLEYS, CA. 1775. Perhaps in part Piankashaw. The drainage pattern has all the characteristics of being Indian. The map is untitled and unendorsed.

Size of the original: 157 × 91 cm. Photograph courtesy of the British Museum, London (Stonyhurst 25a16). By permission of Stonyhurst College, Lancashire.

with the Dowaganhaes and other Farr Indians, wee have endeavoured to acquaint you by the sending of a large skinn upon which the Castles are painted with whome wee have concluded a peace, meaning that Elk skin sent by Captⁿ Bleeker and David Schuyler where there is two Castles painted with red upon itt, adding, they have made peace with seaven nations and that the two nearest nations are only painted as being the principall.¹⁴⁰

It is not clear whether the skin contained information such as rivers, lakes, or trails. The two “castles”—fortified log structures—may have been depicted merely as place signs, perhaps equivalent to the linearly sequenced place symbols on Five Nations wampum belts (figs. 4.29 and 4.30). The elkskin map appears to have been selective, incorporating only two of the seven nations concerned, and its information was supplemented by the sachem’s oral account.

In the following month, Nanfan wrote to the Lords of Trade and Plantations informing them of the council and sending a draft, “the most accurate I have been able to procure, of the situation of our Five Nations,” which included as well an indication of land the Iroquois ceded to the colony in exchange for British protection. This map is likely to have been that made by Samuel Clowes and may have incorporated information from the elkskin sent to Nanfan.¹⁴¹

A similar map on skin, known only through accounts, was made in 1769 during skirmishing between the French and English in what has subsequently been referred to as King William’s War. The allegiance of the Iroquois was to the English, and on 1 October at Albany, Cayenquara-goes, one of their chiefs,

laid down a bundle of bever skins, and on the outside thereof a draft of the river of Canada, with the Chiefe places thereof marked, to show the smallness of the Enemy, and how seated upon Canada river which they desire be sent over and shown to the Great King.¹⁴²

Another account of the same event indicated that they

have sent to His Majesty a small bundle of bever skins four black strokes upon the outside representing the river of Canada and 3 round strokes signifying the 3 principal places.¹⁴³

A third account referred to a “bundle of bever with their description of Canada,”¹⁴⁴ conveying the idea of the St. Lawrence River and the three main French settlements thereon: Quebec, Trois-Rivières, and Montreal. As in the Delaware Indian drawing on a blazed tree of almost one hundred years later (fig. 4.28 above), the use of black signified enemy, in this case the French. Whether the map was on one skin only or a bundle of beaver pelts is not

clear. It was certainly not rich in detail. Though undoubtedly on skin, its geometry and role appear to have had much in common with a wampum belt.

SOUTHEAST

Although no precontact maps survive from the Southeast, Waselkov has concluded, from accounts by colonial Euro-Americans, that “drawing maps was within the competence of every adult southeastern Indian of the colonial period.”¹⁴⁵ It is certain that within a short period after contact Indians from the Southeast drew, painted, and inscribed what were both intended and immediately recognized by Europeans as maps, and that that practice continued. In 1754 Governor James Glen of South Carolina implied that, among the Cherokees at least, ephemeral maps and maps on paper were made interchangeably. From 1743 onward, in seeking to verify oral accounts given by the Indians of the region between the southern Atlantic seaboard and the lower Mississippi River, he had “often made them trace the Rivers on the Floor with Chalk, and also on Paper,” concluding that “it is surprising how near they approach to our best Maps.”¹⁴⁶

The celestial world was the primary concern of many, perhaps most, immediate precontact cultures in North America.¹⁴⁷ Within the Southeast, the Ohio and middle Mississippi Valleys are noted for enormous earthworks, generally known as mounds. Built during the Hopewell-

sonian Institution, 1978–), 15:362–67, and Helen Hornbeck Tanner, ed., *Atlas of Great Lakes Indian History* (Norman: University of Oklahoma Press for the Newberry Library, 1987), 34.

140. Text of speech by Iroquois sachem as translated by Robert Livingston, 14 July 1701, Public Record Office, London, State Papers Colonial (C.O. 5/1046/33).

141. Letter from Lt. Govr. Nanfan to the Lords of Trade and Plantations, 20 August 1701, Public Record Office, London, State Papers Colonial (C.O. 5/1046/33). Clowes’s map is C.O. 700 New York no. 15.

142. Journal of Governor Fletcher’s expedition to Albany, 1 October, 1696, Public Record Office, London, State Papers Colonial (C.O. 5/1039/70, enc. 1).

143. Letter from Governor Fletcher to the Duke of Shrewsbury, 9 November 1696, Public Record Office, London (C.O. 5/1039/71).

144. Letter from Governor Fletcher to the Lords of Trade and Plantations, 9 November 1696, Public Record Office, London (C.O. 5/1039/70).

145. Gregory A. Waselkov, “Indian Maps of the Colonial Southeast,” in *Powhatan’s Mantle: Indians in the Colonial Southeast*, ed. Peter H. Wood, Gregory A. Waselkov, and M. Thomas Hatley (Lincoln: University of Nebraska Press, 1989), 292–343 (quotation on 292), provides detailed descriptions and explanations of the maps in question.

146. James Glen to Sir Thomas Robinson, Secretary of State for the Southern Department, South Carolina, 15 August 1754; unpublished transcript in South Carolina Archives Department, Columbia, Records in the British Public Record Office relating to South Carolina, 1663–1782 (vol. 26, p. 97).

147. Grieder, *Origins of Pre-Columbian Art*, 100–101 (note 49); the Southeast had a third wave culture in late precontact times, characterized by a new preoccupation with the celestial; see also pp. 176 and 181.

ian period (ca. 200 B.C. to A.D. 400), they were associated with burials. Many were effigies: birds, bears, and snakes represented either in plan or in profile. Others incorporate regular geometric shapes: circles, squares, octagons, ellipses, and rectangles.¹⁴⁸

It has also been proposed that some of these represented constellations.¹⁴⁹ For example, the Effigy Mounds National Monument by the Mississippi River at McGregor in eastern Iowa is made up of an arc of ten “marching” bears and three birds; the latter apparently placed randomly in relation to the arc. Thaddeus Cowan claimed that

the [bear] effigies marching line is oriented in an expected way with the march of Ursa Major [Great Bear constellation] around Polaris. The orientation of each bear is what would be expected from Indian legend. The path of the bear effigies follows the summer path of Ursa Major. The direction of the Bird Effigies relative to the end of the Bear’s march is in keeping with the direction of [the constellation] Cygnus relative to Ursa Major at the end of his arc. The distance between the bird mounds and the bear mounds representing the bottom of the arc suggests the appearance of Cygnus at the time when Ursa Major reaches its bottom most point in the sky.

Cowan ended with an admission that the “evidence is hardly definitive,” followed by a plea that the proposition “merits further investigation.”¹⁵⁰

EARLY MAPPING ENCOUNTERS

The map of Florida and the Gulf Coast made after Hernando de Soto’s expedition through southeastern North America between 1539 and 1543 almost certainly incorporated Indian information, some quite likely given in cartographic form (fig. 4.35). Neither of the two accounts of the expedition explicitly mentions Indians’ making or using maps in response to Spanish requests for information, but such practices were likely.¹⁵¹ The de Soto expedition map, almost certainly made in Seville by Alonso de Santa Cruz, “archicostmographer” to Charles V of Spain, conforms to the geography of the area more closely than would have been possible through reconnaissance on de Soto’s route alone. In particular, long rivers that the expedition crossed only once in its complex traverse are represented in their entirety and essentially correctly, far more so than native words or gestures could have communicated.¹⁵²

Another early text describes the making of a map of the lower Mississippi and Neches Rivers and a region to the west perhaps extending to the lower Pecos River. The map is notable for having been made on bark, rare in this region. It was drawn at the Cenis village near the head of the Neches River in what is now eastern Texas

“with a Piece of Coal . . . on the white Bark of a Tree” for René-Robert Cavalier de La Salle. The map satisfied La Salle that he was “within six days journey from the Spaniards.”¹⁵³ It was almost certainly the same map described elsewhere as “a very exact map of the neighboring rivers and nations,” to which was added: “They [the Cenis] knew the Spaniards, and depicted to us their clothing, etc.”¹⁵⁴ In the accounts of the map made for La Salle there is no indication of the type of bark used. Eastern Texas is well beyond the southern limit of the paper birch, which has the bark best suited to inscribing and drawing and was typically used in the Northeast and Subarctic.

It is possible that a similar map was incorporated in a manuscript map made by Lawrence van den Bosh six or seven years later, representing the lower Mississippi and an extensive area to the west (fig. 4.36). A letter of transmittal by the mapmaker refers to the countries and rivers to the left (west) of the Mississippi “which discription I lately reced. of the French Indian.”¹⁵⁵ In what form the description was received is not made clear but, as for the much earlier map based on the de Soto expedition, it seems very unlikely that an essentially correct geography could have been communicated without graphic representation.¹⁵⁶

148. Having surveyed many of the sites, James A. Marshall reached several speculative conclusions. Among these, two might be pertinent here: that the builders planned “on a drawing board or sand table . . . earthworks of specific measure and area” and that they had a “well developed ability at landmeasure,” with which “came ability to view the terrain as if on a map.” Likewise, he recognizes a unit of linear measure equivalent to 57 meters, but there is no indication that this was used in the Southeast or elsewhere since contact, certainly not in the context of making maps. James A. Marshall, “An Atlas of American Indian Geometry,” *Ohio Archaeologist* 37 (1987): 36–48, esp. 40.

149. Thaddeus M. Cowan, “Effigy Mounds and Stellar Representation: A Comparison of Old World and New World Alignment Schemes,” in *Archaeoastronomy in Pre-Columbian America*, ed. Anthony F. Aveni (Austin: University of Texas Press, 1975), 217–35.

150. Cowan, “Effigy Mounds and Stellar Representation,” 234.

151. Edward Gaylord Bourne, ed., *Narratives of the Career of Hernando de Soto*, 2 vols., trans. Buckingham Smith (New York: A. S. Barnes, 1904), and James Alexander Robertson, ed. and trans., *True Relation of the Hardships Suffered by Governor Fernando de Soto*, 2 vols. (De Land: Florida State Historical Society, 1933).

152. De Vorsey notes that the braiding river systems reflect failure to distinguish between canoe routes and transwatershed portages—a characteristic indicative of Indian information sources. De Vorsey, “Silent Witnesses,” esp. 715–17 (note 22). To this can be added two named “sals.” Salt was a vital resource for Indians and was widely traded.

153. Louis Hennepin, *A New Discovery of a Vast Country in America*, 2 pts. (London: M. Bentley and others, 1698), pt. 2, 25.

154. Jean Delanglez, trans. and ed., *The Journal of Jean Cavalier: The Account of a Survivor of La Salle’s Texas Expedition, 1684–1688* (Chicago: Institute of Jesuit History, 1938), 102–3.

155. Back of the map, Newberry Library, Chicago (Ayer no. 59).

156. For a full account of this important map, see Waselkov, “Indian Maps,” 294–95 and 309–13 (note 145), which explains how a manuscript map made in northeastern Maryland by a man who had never been to the Mississippi Valley almost certainly incorporated informa-

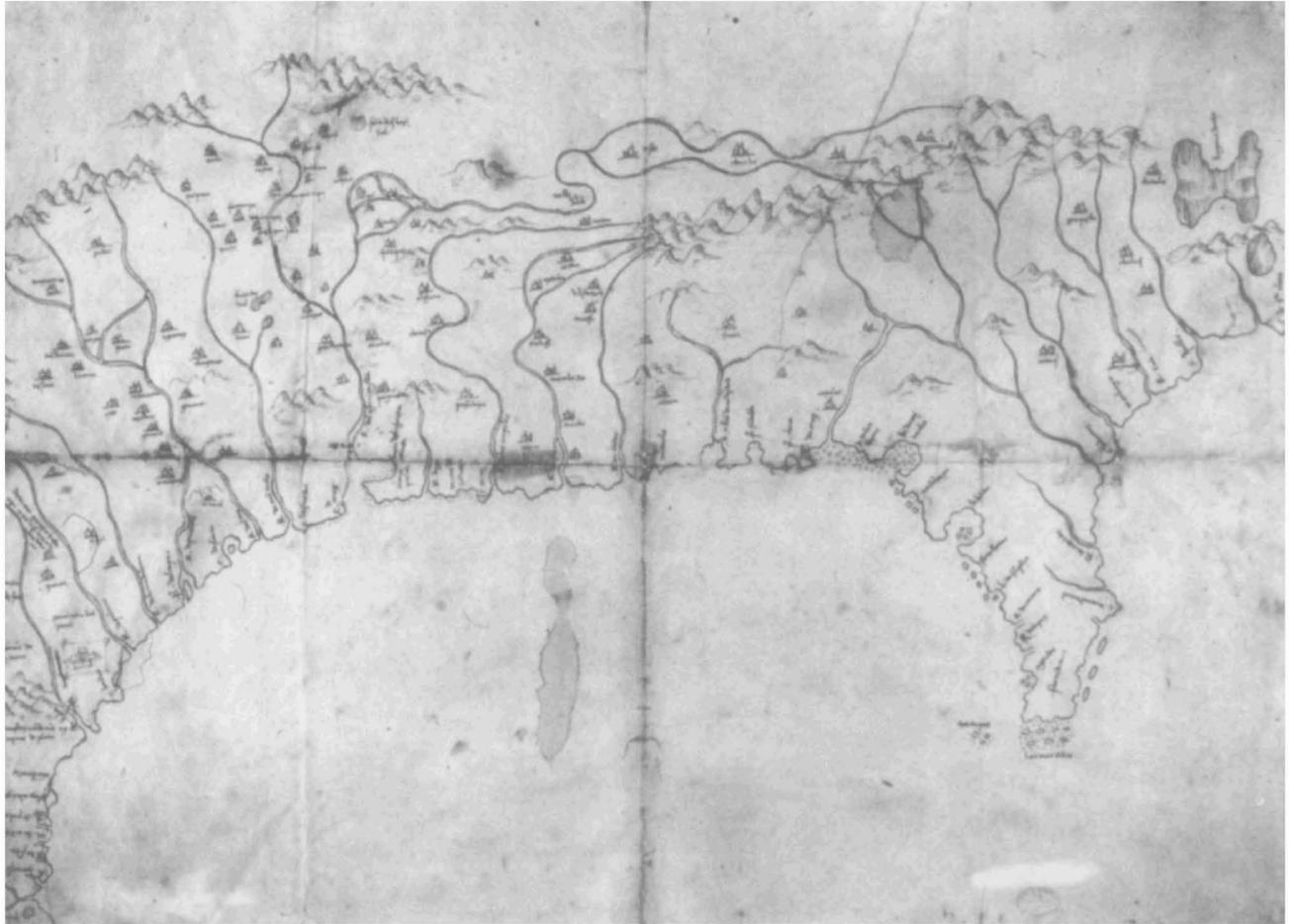


FIG. 4.35. MAP OF FLORIDA AND THE GULF COAST, CA. 1544. Mapa del Golfo y costa de Nuevo España, desde el Río de Panuco hasta el cabo de Santa Elena. “De los papeles que traxeron de Sevilla de Alonso de Santa Crus” (endorsement on the back). Ink on paper, made from reports of members of the

de Soto expedition, possibly including maps drawn by Indians or from Indian information.

Size of the original: 44 × 59 cm. Photograph courtesy of the Ministerio de Cultura, Archivo General de Indias, Seville (Mapas y Planos, México, 1).

Early in 1708, a Towasa Indian named Lamhatty from the Florida Gulf Coast drew a map showing coasts, rivers, mountains, and named places along the path of a nine-month journey of approximately sixteen hundred kilometers. Figure 4.37 is a contemporary transcript of the map. The previous spring, Lamhatty had been captured by Creeks at his home village, Towasa, to the west of the lower Apalachicola River, and taken to Creek towns on the Tallapoosa River, where he was forced to work in the fields. That autumn his captors took him east via Oconee and then through the “vastly big” southern Appalachians to the headwaters of the Savannah River, where he was sold to Shawnees. The Shawnees marched him north “along the ledge of Lower mountains,” but he escaped and headed east for nine days before surrendering to English backcountry settlers, for whom he drew a map naming or mentioning all these places.¹⁵⁷

In forwarding a transcript of the map to the governor of Virginia, John Walker included his own account

of Lamhatty’s arrival at the British settlement and the account of Robert Beverley, another Englishman. The Towasa spoke a Timucuan language not related to any other groups of languages in North America. A Tuscarora Indian of the northern Iroquoian language stock and another interpreter tried to translate Lamhatty’s story for the English, but both accounts state that Lamhatty, although eager to communicate, could not be understood. It is not clear, therefore, how the notations on the map and the account of Lamhatty’s captivity related by Bever-

tion brought from the Illinois country by a Shawnee or Miami Indian, and how that information had been brought there from the eastern Texas region by returning members of the La Salle expedition. A number of features on the van den Bosh map can be matched to descriptions of the map made for La Salle.

157. Gregory A. Waselkov, “Lamhatty’s Map,” *Southern Exposure* 16, no. 2 (1988): 23–29, esp. 24–25. The map is also reproduced and discussed in David I. Bushnell, “The Account of Lamhatty,” *American Anthropologist*, n.s. 10 (1908): 568–74, and Waselkov, “Indian Maps,” 296 and 313–20.

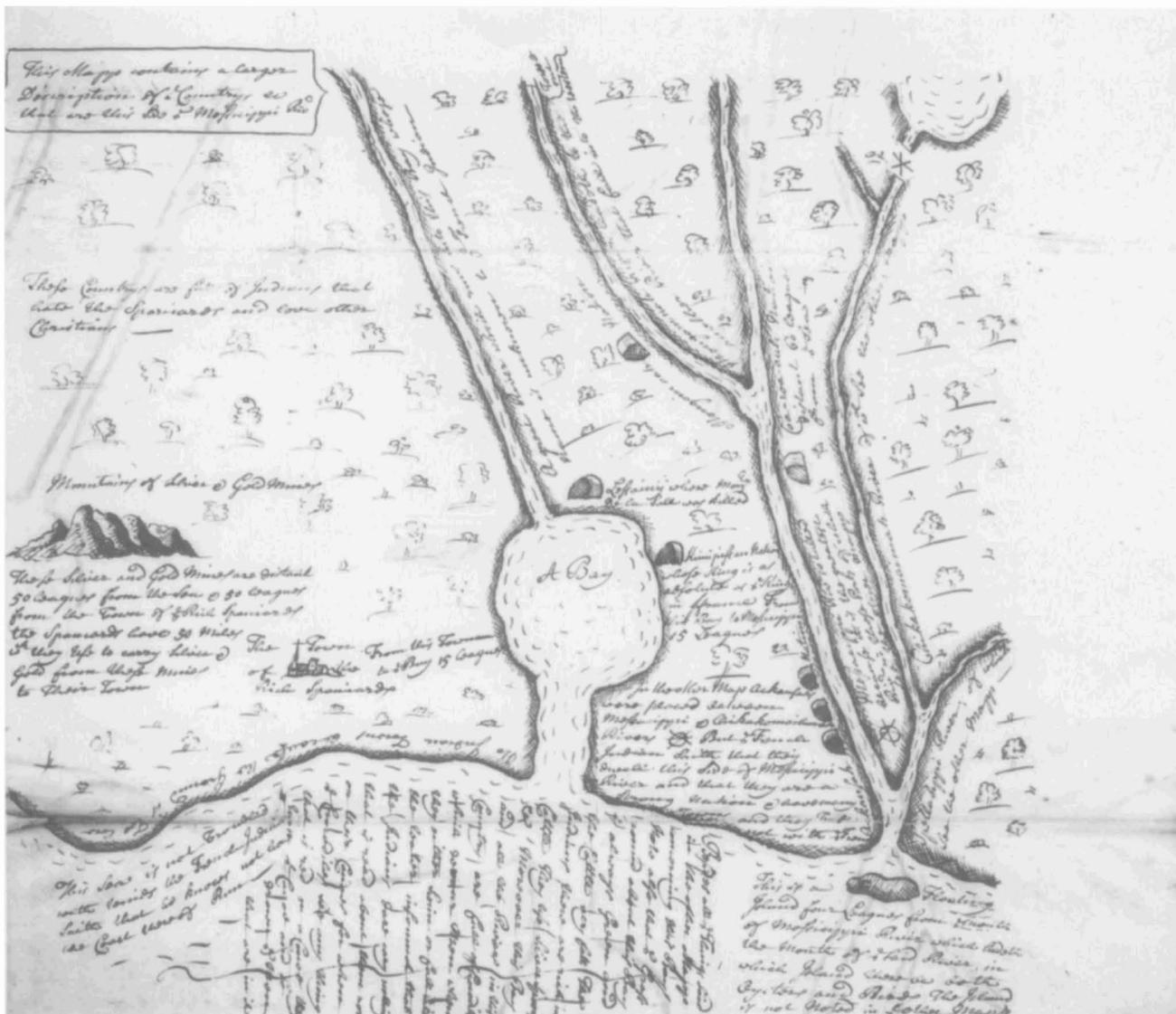


FIG. 4.36. MANUSCRIPT COPY, CA. 1694, OF A MAP BY LAWRENCE VAN DEN BOSH, POSSIBLY BASED ON A MAP BROUGHT EAST BY SHAWNEES. The map is of the country west of the lower Mississippi and of the neighboring coast and country to the southwest. It includes the names of several Indian villages and one Spanish settlement, probably a Spanish mission established in the upper Neches Valley in

1691. Indian-style elements include relatively straight rivers, the enlarged, nearly circular Galveston Bay, and rectangular barrel-roofed houses.

Size of the original: 32 × 38 cm. Photograph courtesy of the Edward E. Ayer Collection, Newberry Library, Chicago (no. 59).

ley and Walker were communicated. How much of the written account was pictographically represented on Lamhatty's original map is not known, but given the language barrier, it is reasonable to suppose that all of it could have been.

The main rivers on the transcript of Lamhatty's map have a sinuosity in marked contrast to what is seen in other maps (see, e.g., figs. 4.38 and 4.43). A similar depiction of rivers can be seen in another map associated with Florida, the map of southeastern North America, ca. 1544 (fig. 4.35 above).¹⁵⁸ Since de Soto did no more than

cross the upper courses of most of these rivers between 1540 and 1541, he may have represented their lower courses based on information from the Indians of north-eastern Florida with whom he had wintered, perhaps

158. The similarly sinuous rivers on figure 4.35 were probably drawn based on information obtained from Indians met en route. Interestingly, the Indians with whom he spent the ten months before entering the interior were the Timucuan speakers of northwestern Florida. Unfortunately, the extent of de Soto's influence on the extant map is not known, although it is almost certainly based on information brought back by one or more members of his expedition.



FIG. 4.37. CONTEMPORARY MANUSCRIPT TRANSCRIPT OF LAMHATTY'S MAP. The map showed Lamhatty's journey in captivity from his home near the Florida Gulf Coast through the southern Appalachians to the Virginia coastal plain in 1708. The original was Towasa; this supplemented manuscript transcript, ink on paper, is perhaps by

adopting some of their stylistic conventions. The festooning double lines representing rivers on both maps have something in common with some of the maps made by Mesoamericans in the early colonial period.¹⁵⁹ Other links exist between Indians of Florida and Mesoamerica. The Towasa language has recently been classified as a member of the Chibchan-Paezan language stock, most languages of which are found in Central and South America; almost exclusively in the Cordillera, discontinuously from southern Mexico to western Argentina.¹⁶⁰ These regions have also been grouped together on the basis of pre-Columbian art forms, including the characteristic "S-design," in

Robert Beverley, whose one-page account is on the back. Among maps made by North American Indians, the sinuous lines representing rivers are unusual but not unique. Size of the original: 26.5 × 29.5 cm. Photograph courtesy of the Virginia Historical Society, Richmond (Lee Family Papers 1638–1867, sec. 163, MS. 1L51, f. 677).

which the S can face forward or backward and be long or short.¹⁶¹

Equally unusual on Lamhatty's map are the transverse

159. Several examples of similar hill profiles and double-line rivers (not always festooned) are reproduced in Mary Elizabeth Smith, *Picture Writing from Ancient Southern Mexico: Mixtec Place Signs and Maps* (Norman: University of Oklahoma Press, 1973), figs. 122–36. See also below, the Lienzo of Zacatepec, fig. 5.13.

160. Joseph H. Greenberg, *Language in the Americas* (Stanford: Stanford University Press, 1987), 382 and 388–89.

161. Grieder, *Origins of Pre-Columbian Art*, fig. 1 (pp. 16–17) and 116–28 (note 49).

profiles (as distinct from isolated hill symbols) symbolizing the alternating ridges and valleys of the southern Appalachians through which he passed. Perhaps because of his origins in the flatland environment of a coastal plain, he was particularly aware of the considerable effort needed to cross a series of parallel steep ridges. Indeed, he had made an earlier map of part of the area with “heaps of dirt.”¹⁶²

OFFICIAL MAPS MADE FOR COLONIAL AUTHORITIES

The record and transcript of Lamhatty’s map survive because they were sent to a colonial official. Similarly, maps made for official presentation to royalty and their colonial representatives are among the best-known examples of what early Indian maps may have looked like. Two important maps were made for Francis Nicholson, who, while serving as governor of Maryland, Virginia, and South Carolina (1721–28), was particularly interested in Indian maps and geographic information.¹⁶³ The maps are a Chickasaw map from about 1723 of the whole of southeastern North America, perhaps the most extensive area ever mapped by North American Indians (fig. 4.38) and a Catawba map from about 1721 of the hinterland of South Carolina, of which two transcripts exist (see plate 4).¹⁶⁴ Each of the two original maps was made on deer-skin by a cacique and presented to Nicholson when he was governor of South Carolina. Nicholson then sent transcripts to his superiors in England, including one of the Catawba map sent to the Prince of Wales. The transcripts are in black ink and a red pigment on paper trimmed to approximately the shape and size of a deer-skin. The Catawba map is probably closer to the original than the Chickasaw map. All the linework is freely drawn on the former, whereas a compass was obviously used in copying the circles on the latter. For reasons of aesthetics, intelligibility, or propriety, the transcripts may have been modified considerably. For example, the Chickasaw map contains two pictographic drawings: one small pointing hand (lower left) and an armed Indian warrior leading a horse. Yet there are many empty spaces on the transcript where the original may have contained additional pictographs.

The Chickasaw map embraces more than a million square kilometers of what is now the south-central United States. As well as being vast, the area represented was culturally diverse.¹⁶⁵ The map could not possibly have been based on the direct experience of one individual or even the experiences of a single generation. Such accumulated and shared knowledge would have been made possible and greatly assisted with the emergence through much of the vast area of the jargon or trade language known as Mobilian.¹⁶⁶

The Chickasaw chief’s nation is represented almost at

162. This account of map modeling is much briefer and more ambiguous than others described in this chapter. It is contained in a letter of 16 January 1708, from Lt. Col. John Walker, to whose home the Indian Lamhatty had been brought, to Governor Edmund Jennings. The relevant part of the letter is as follows: “They [Indians who had bought Lamhatty from his captors] in a short time took him out a hunting . . . along y^e ledge of Lower mountains, (as he at first described to us by heaps of dirt tho’ his geography has not made him hit it right in his draught).” The letter, the original of which is in the Archives Department of the Virginia State Library, was reproduced in John R. Swanton, “The Tawasa Language,” *American Anthropologist*, n.s. 31 (1929): 435–53, esp. 436–37. According to Waselkov, the Indians who took Lamhatty hunting were Shawnees from the upper Savannah River region (Waselkov, “Indian Maps,” 320 [note 145]). If so, “y^e ledge of Lower mountains” could well have been the Blue Ridge near where the present states of South Carolina, Georgia, and Tennessee converge.

163. In addition, the map by van den Bosh discussed above was sent to Nicholson in 1694. It is not clear whether Nicholson had requested it or van den Bosh was merely attempting to curry favor, but the map may have alerted him to the potential importance of Indian geographical information about the little-known but geopolitically important interior. By 1699, as governor of Virginia, he was aware of French threats to English trade in the trans-Appalachian region and urged Joseph Blake, governor of South Carolina, territory closer to the critical lower Mississippi Valley, to “have the Account of these Countrys from Some Indians, which you can rely upon.” He cited Louis Hennepin’s maps from Indian sources and sent his fellow governor a copy of Hennepin’s *New Discovery* (1698) (note 153). Francis Nicholson, letter to Governor Joseph Blake of South Carolina, Jamestown, Virginia 25 September 1699, Public Record Office, London (C.O. 5/1311/10 liv [10]).

164. The two very similar versions of the Catawba map are figure 4.39 and “A Map Describing the Situation of the Several Nations of Indians between South Carolina and the Massisipi River; Was copied from a Draught Drawn & Painted upon a Deer Skin by an Indian Cacique; and Presented to Francis Nicholson Esqr. Governour of Carolina”; the latter, about 1721, is 81 by 112 centimeters; Map Room, Public Record Office, London (North American Colonies General no. 6 [1], C.O. 700).

165. According to standard regional divisions, it included parts of three of the continent’s ten native culture areas (Southeast, Northeast, and Plains), five of its seventeen dominant native language areas (Muskogean, Iroquoian, Algonquian, Siouan, and Caddoan), and three of its five dominant types of native subsistence areas (fish, cultivated plants, and game); Carl Waldman, *Atlas of the North American Indian* (New York: Facts on File, 1985), figs. 3.8, 3.34, and 3.5. For a comprehensive interpretation of the map, see Waselkov, “Indian Maps,” 324–29 (note 145). The map is also interpreted in G. Malcolm Lewis, “Travelling in Uncharted Territory,” in *Tales from the Map Room: Fact and Fiction about Maps and Their Makers*, by Peter Barber and Christopher Board (London: BBC Books, 1993), 40–41.

166. There is some doubt as to the date of origin of Mobilian. The earliest reliable attestations are dated 1699; this was the year the first Frenchman, Pierre Le Moyne d’Iberville, reached the Mississippi Delta by sea from the east, twelve years after the first Spaniards, Martín de Rivas and Pedro di Irarte, had done so from the west and thirteen years after Henri de Tonty had reached it from upriver. At least one authority on Mobilian believes it was “possibly of pre-European origin with roots in a (non-pidginized?) contact language based on Western Muskogean”; Emanuel J. Drechsel, “A Preliminary Sociolinguistic Comparison of Four Indigenous Pidgin Languages of North America,” *Anthropological Linguistics* 23 (1981): 93–112, esp. 102. Significantly, Chickasaw, the mapmaker’s language, was one of two Western Muskogean languages. According to Drechsel’s map (p. 100), the spread of Mobilian coincided very approximately with the territory covered by

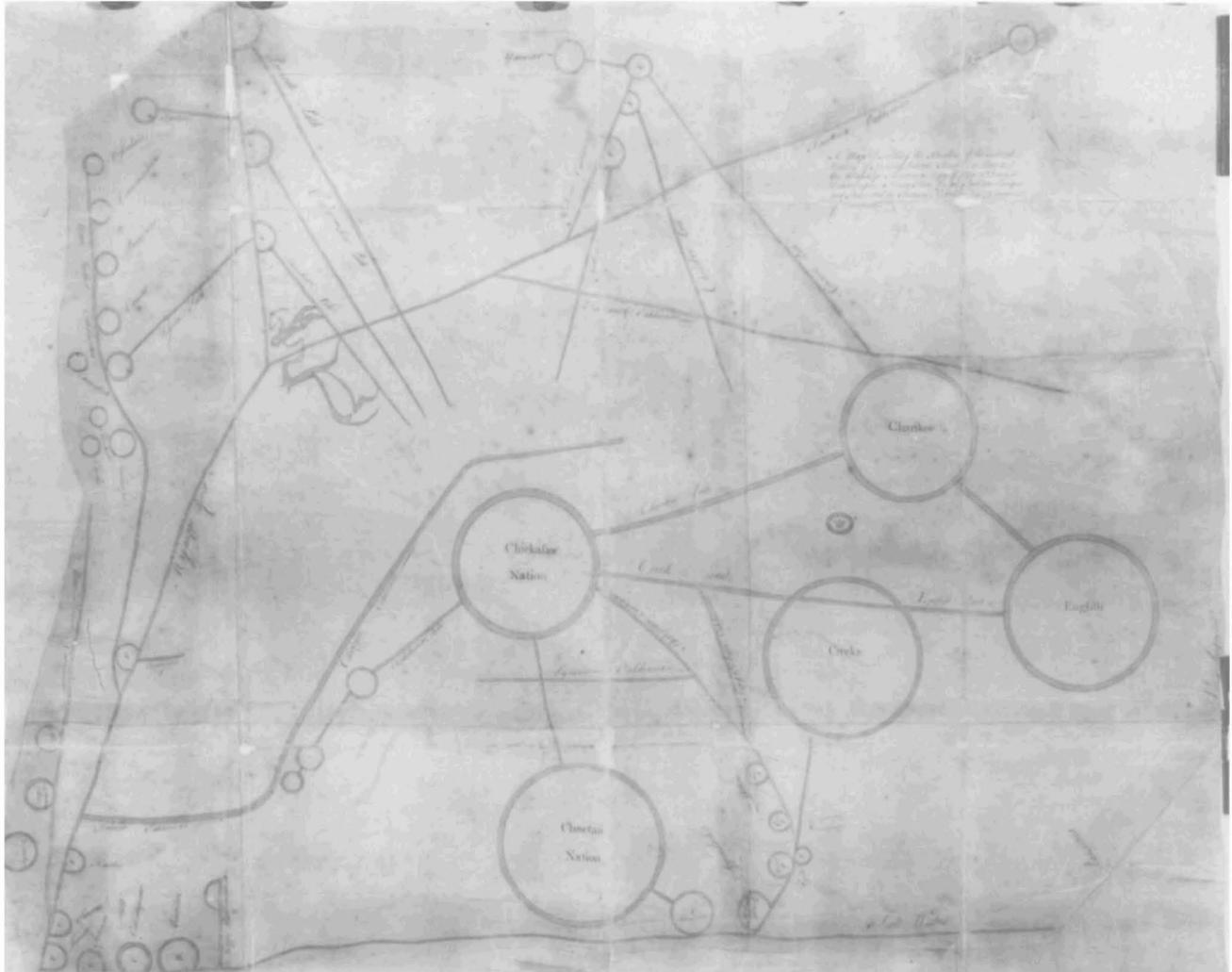


FIG. 4.38. SUPPLEMENTED MANUSCRIPT COPY OF A CA. 1723 CHICKASAW MAP ON SKIN OF INDIAN AREAS IN SOUTHEASTERN NORTH AMERICA. Caption, upper right: "A Map Describing the Situation of the several Nations of Indians between South Carolina and the Missisipi; was Copied from a Draught Drawn upon a Deer Skin by an Indian Cacique and Presented to Francis Nicholson Esq'. Gov-

ernour of Carolina." Made to affirm the alliances and trading relationships between the Chickasaws, other Indians, and the English, the map also emphasized the isolation of the Chickasaw Nation from Indians allied to the French to the south, west, and north.

Size of the original: 114 × 145 cm. Photograph courtesy of the Public Record Office, London (C.O. 700/N.A. 6[2]).

the center. Comparing the drainage network on the map with that on a modern map, we see that this central area is not necessarily represented in greater detail (the information content thereabouts is no more than in some other parts of the map) but is shown large and relatively undistorted in relation to the rest (fig. 4.39). Radially away from it in each direction, though least so to the south, directional distortion increases, area diminishes, and shape becomes increasingly deformed. The forty-five-degree clockwise rotation of the Red and Arkansas Rivers in relation to the Mississippi River and the excessively straight representation of the eastern Gulf Coast close to and parallel with one of the flanks of the skin were doubtless due to peripheral constraints imposed by the shape and size of the deerskin.¹⁶⁷

the Chickasaw map of about 1723, though its maximum extent may not have been achieved until a later date. For a wide-ranging review of non-graphical communication by native North Americans to Europeans, see G. Malcolm Lewis, "Native North Americans' Cosmological Ideas and Geographical Awareness: Their Representation and Influence on Early European Exploration and Geographical Knowledge," in *North American Exploration*, ed. John Logan Allen, vol. 1, *A New World Disclosed* (Lincoln: University of Nebraska Press, 1997), 71–126. And in volume 3, *A Continent Comprehended*, of the same series, see William H. Goetzmann, "A 'Capacity for Wonder': The Meanings of Exploration," 521–45, esp. 528–32, for a more limited review of native North Americans' geographical lore and its significance in facilitating exploration and discovery by Europeans and Euro-Americans.

167. There is no indication whatever of major features that occur on the coast: the eastern part of the birdsfoot delta of the Mississippi River; the distinctively deep Mobile Bay; the string of offshore islands with the sounds and deep bays behind them; and perhaps the western part of the bold Apalachicola delta.

Not all physically prominent features were shown on the map. To the southeast, the Florida peninsula, the southern Atlantic seaboard, and the rivers flowing to it from the southern Appalachians were all omitted. All could have been accommodated but were irrelevant to the Chickasaws' representation of the geopolitical relations between themselves, other Indian nations, the English, and the French. The English controlled the seaboard absolutely, and neither the Spaniards nor the Indians of the Florida peninsula constituted a threat. Conversely, the Yazoo River, relatively small regionally, was represented with an emphasis and magnitude even greater than that given the Mississippi River below the Ohio confluence. Significantly, on a map made by Chickasaws, the upper part of the Yazoo is named "Chickasau Oakhinnau [river]." Topological principles readily accommodated parochialism, the promotion of regions, and geopolitical manipulation. For the British the primary interest of the map was political—it would not have helped them in planning journeys or wayfinding. Their focus on its political content may have led English copyists to omit pictographs that did not seem relevant to the strategic relations between themselves, the French, and Indians allied with each power.

The motivation and criteria for copying the Catawba deerskin map in 1721 (plate 4) were similar to those for the Chickasaw map of two years later. Indeed, the same draftsman (perhaps William Hammerton) may have made the transcript. Although paths and Indian nations or villages are the dominant components of both maps, they are drafted on the Catawba map without the use of drawing compass or ruler. Straight lines do, however, depict schematically the world of the English colonists on the coast in and around Charlestown (Charleston): roads, probably county boundaries, and perhaps even parish boundaries. In making the transcript, the draftsman was highlighting the cacique's attempt to distinguish between the natural world of the interior and the new and blatantly altered landscape of the rapidly growing English and Huguenot settlement. With the exception of the large circles depicting the Cherokees and Chickasaws, all the villages appear to have been Catawba, then situated in the Wateree-Catawba Valley on the South Carolina Piedmont. This was still a little-known region, and printed maps of it represented several large but nonexistent lakes. The only named path is "The English Path to Nasaw," which may have been the line of the road that later linked Charleston with Columbia. As with the Chickasaw map of 1723, the Catawba map was an up-to-date Indian statement concerning geopolitical relations.¹⁶⁸

Two transcripts of Indian maps on deerskin were made by the draftsman and architect Alexandre de Batz. The originals of both maps were collected by the Captain of Pakana, an Alabama war leader and French emissary to the Chickasaws in 1737. As emissary, he had two objec-

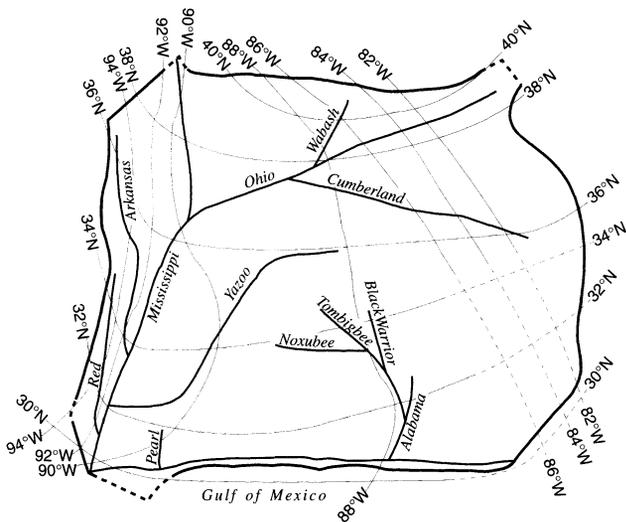


FIG. 4.39. DISTANCE DECAY AND DISTORTION ON A CHICKASAW MAP, CA. 1723 (FIG. 4.38). This diagram has meridians and parallels superimposed based on the river sources and confluences and some named places depicted on the map. It shows the distance decay and increasing angular distortion away from the Chickasaw core.

tives: to establish the strength and distribution of the Chickasaw nation, and to obtain the release of captives taken in two French defeats the previous year. One map, "Plan et Scituation des Villages Tchikachas," probably made by the Captain of Pakana, addressed the first of these. It shows the locations of ten Chickasaw villages, one Natchez village, the paths between them, nearby bayous and clearings, and the routes of earlier French attacks on the Chickasaws (fig. 4.40). It was apparently produced to communicate information about the Chickasaws to the French, who had been and were to be again at war with the Chickasaws. It is highly stylized, with straight paths linking circular nodes. There seem to be three circle sizes. They suggest a ranking of villages, though it is not clear by what criterion. The three largest circles include two at the center and Ogoula Tchetoka (near modern Tupelo, Mississippi),¹⁶⁹ where the Chickasaw leader Mingo Ouma lived. All the other Chickasaw villages are represented by medium-sized circles. The one slightly smaller circle represents a village of the Natchez. Small rectangular, fieldlike symbols between the villages are labeled "deserts." Although this is a common convention on French maps of the period and must have been introduced by de Batz, it is not known whether it was used here to represent cultivated areas or openings in the forest that may once have been cultivated.¹⁷⁰

168. See Waselkov, "Indian Maps," 320–24 (note 145).

169. James R. Atkinson, "The Ackia and Ogoula Tchetoka Chickasaw Village Locations in 1736 during the French-Chickasaw War," *Mississippi Archaeology* 20 (1985): 53–72.

170. See Waselkov, "Indian Maps," 332–34 (note 145); Marc de Villiers du Terrage, "Note sur deux cartes dessinées par les Chikachas en

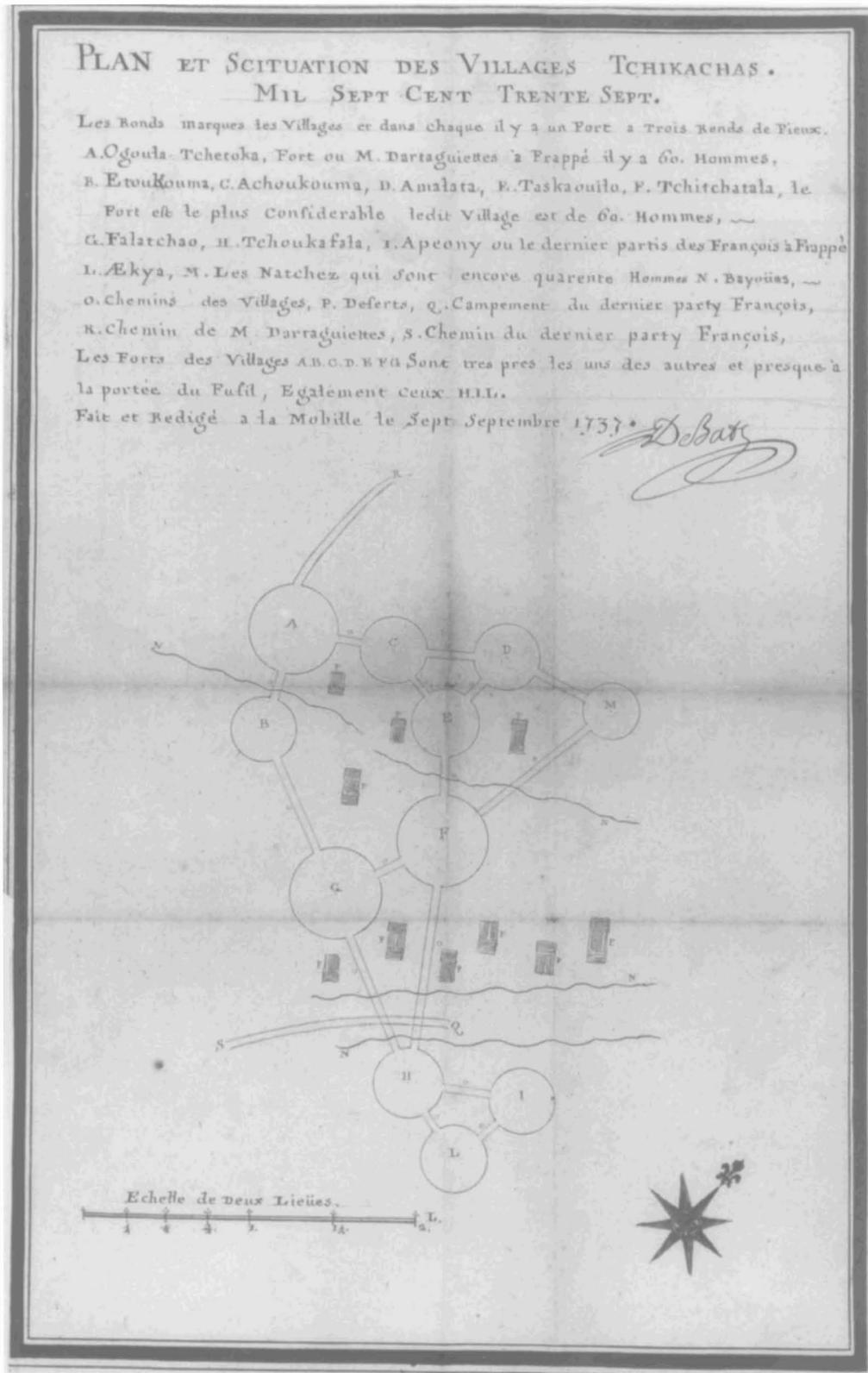


FIG. 4.40. SUPPLEMENTED MANUSCRIPT COPY OF AN ALABAMA MAP. This contemporary transcript by Alexandre de Batz of a map by the Captain of Pakana (Alabama headman) illustrates the paths connecting the Chickasaw villages in what is now northeastern Mississippi. “Plan et Scituation des Villages Tchikachas,” signed manuscript ink on paper, 7

September 1737. There is also an unsigned manuscript copy in L’atlas Moreau de Saint Méry (F3 290 14), Directions des Archives de France, Aix-en-Provence. Size of the original: 51 × 34.5 cm. Photograph courtesy of the Archives des Colonies, Archives Nationales, Paris (C/13/a/22, fol. 68).

The second transcript, “Nations Amies et Ennemies des Tchikachas,” was drawn from a map made by Mingo Ouma (fig. 4.41). When the Captain of Pakana had met with Mingo Ouma, a Chickasaw war chief, Mingo Ouma expressed a desire for peace with the French and suggested that his people and the Alabamas join with them to attack the Natchez. As part of his strategic argument, he gave two copies of the map to the Captain of Pakana, one for the Alabamas and one for the French, from which de Batz made his transcript.¹⁷¹ According to the text accompanying the map:

The circles denote villages and entire nations [black for those friendly to the French and red for their enemies]. A, the English; B, the Cowetas; C, the Kashitas; D, the Yuchis; E, the Tugaloo Cherokees; F, the Cherokees who speak a different language than E; G, the Okfuskees Abekas; H, the Alabamas; I, Mobile, or the French; K, the Choctaws; L, the whole Chickasaw nation, which is white within, but the space [shaded zone between the inner and outer concentric circles] surrounding it is of nothing than blood. It is white because they claim that only good words come from their village, but those of the surrounding country lose their minds by not listening to them at all, and this stains their lands with blood. M, the Huron and Iroquois villages and those they call the Nantouaque; N, the villages and nations of the Tamarods, Piankashaws, etc.; O, the Arkansas or Quapaws; P, the Chachiumias, whom they are going to attack at once; Q, these are the warpaths that do not go as far as the villages, because they hope that they will become white when they [the Chickasaws] make peace with those toward whom they lead; R, River of the Alabamas and the path from that nation to Mobile. It does not go as far as Mobile because they say they would not dare to go there, but in spite of that it is white for us; S, white paths that lead to their friends; T, war paths; V, hunting paths of the Alabama white.

Quite clearly this was a geopolitical statement from the perspective of one southern nation (the Chickasaws) that embraced their friends and enemies in a vast region extending from the Gulf Coast in the south (I, Mobile) to the upper Great Lakes in the north (M, Hurons) and from the Carolina coast in the east (A, English) to the lower Arkansas River in the west (O, Quapaws). As such, the map embraced a similar area, had a similar form, and served a similar function as the Chickasaw map presented to Governor Francis Nicholson in 1723 (fig. 4.38). Though the precise linkages (relationships) and nonlinkages (animosities) between circles (nations) had changed somewhat during the intervening fourteen years, and whereas the earlier map had been intended for English authorities and the later one for the French, the similarities are such as to suggest that both manifested a deeper and perhaps much older cartographic tradition.

Fragments of an engraved shell cup from Spiro, Oklahoma, dating from the Mississippian period (A.D. 900–1450) (fig. 4.42) show a pattern strikingly similar to the colonial-era maps described above (figs. 4.38, 4.39, 4.40, and 4.41).¹⁷² Robert H. Lafferty, noting the resemblance, suggested that the shell may represent important Mississippian sites and the relations among them. Going further, he attempted to map the circles onto archaeologically known sites, assigning the largest circle to the most populated Mississippian site and assuming both conservation of scale in the connecting paths and orientation similar to that of the Chickasaw map of 1737.¹⁷³ Given these assumptions, it is not surprising that the pattern of circles on the shell does not correspond with the distribution of archaeologically established settlements. Notwithstanding the methodological difficulties, Lafferty’s case for the cross-in-circle motif’s being a map is probably stronger than any other claims for supposed large-area maps. This is because it relates to a carefully reconstructed regional economic system that operated during a specific culture period and involves stylistic as well as geometrical evidence.

OTHER SOUTHEASTERN MAPPING ENCOUNTERS

Relatively little is known about southeastern Indian maps that were not accorded official status soon after they were made. Some, perhaps many, may have gone unrecorded. Maps are mentioned in Pierre Le Moyne d’Iberville’s journal, which describes his accidental discovery of the Mississippi Delta when his ship was blown on shore in 1699. Uncertain where he was—information from La Salle’s earlier explorations wrongly showed the lower part of the river to be far to the west¹⁷⁴—he continued to sail inland to establish his whereabouts. Bayougoulas and

1737,” *Journal de la Société des Américanistes de Paris*, n.s. 13 (1921): 7–9; and Patricia Galloway, “Debriefing Explorers: Amerindian Information in the Delisles’ Mapping of the Southeast,” in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis (Chicago: University of Chicago Press, 1998), chap. 10.

171. See Waselkov, “Indian Maps,” 329–34, and Villiers du Terrage, “Note sur deux cartes.”

172. Philip Phillips and James A. Brown, *Pre-Columbian Shell Engravings from the Craig Mound at Spiro, Oklahoma*, 6 vols. (Cambridge, Mass.: Peabody Museum Press, 1975–82), vol. 3, pl. 122.3, with text and diagrams. The pattern as reconstructed from two fragments is described as “concentric cross-in-circle motifs in a connected grid.”

173. Robert H. Lafferty, “Prehistoric Exchange in the Lower Mississippi Valley,” in *Prehistoric Exchange Systems in North America*, ed. Timothy G. Baugh and Jonathon E. Ericson (New York: Plenum Press, 1994), 177–213, esp. 201–5.

174. Louis De Vorsey, “La Salle’s Cartography of the Lower Mississippi: Product of Error or Deception?” in *The American South*, ed. Richard L. Nostrand and Sam B. Hilliard, *Geoscience and Man* 25 (Baton Rouge: Department of Geography and Anthropology, Louisiana State University, 1988), 5–23.

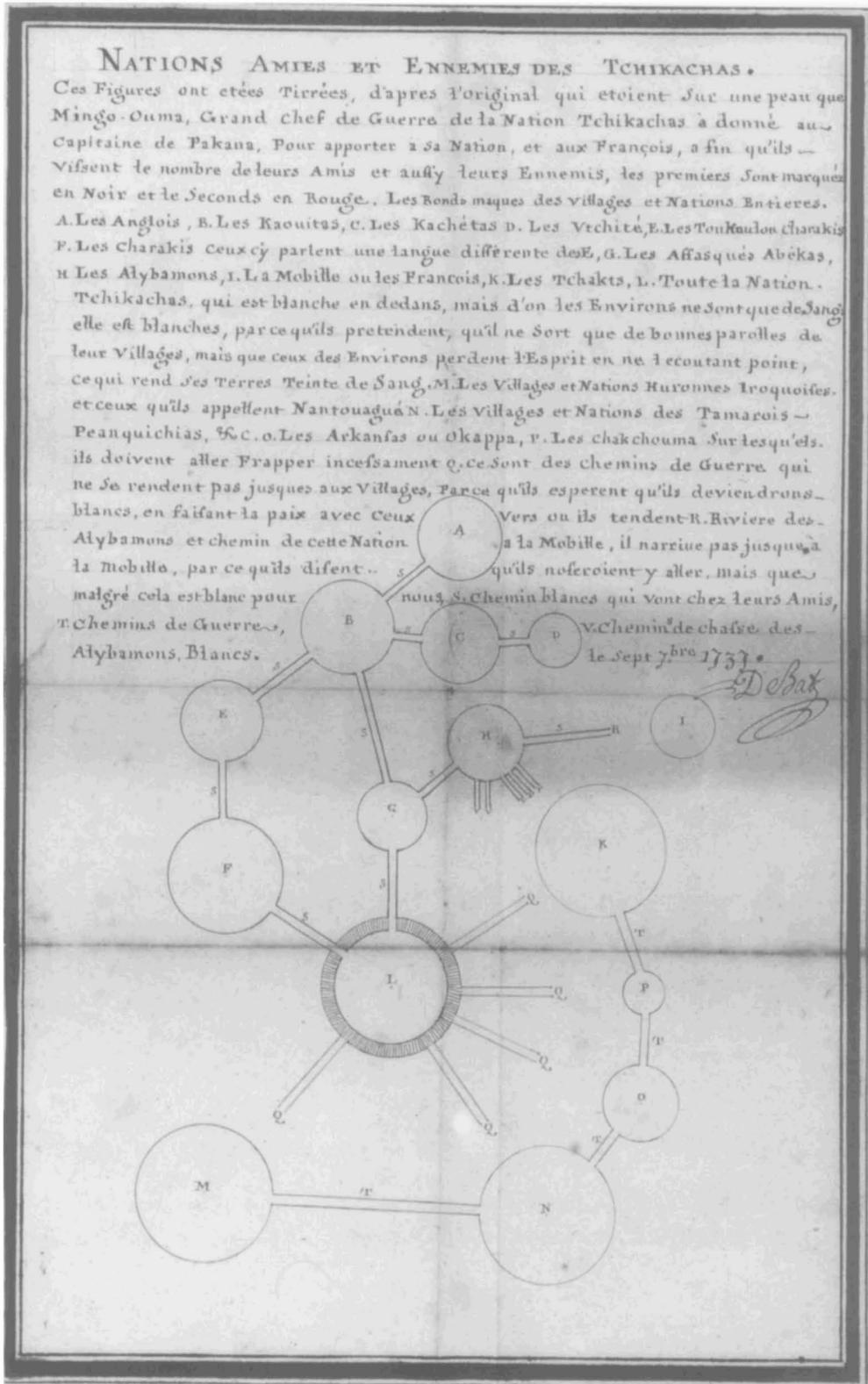


FIG. 4.41. SUPPLEMENTED MANUSCRIPT COPY OF A CHICKASAW MAP. "Nations Amies et Ennemies des Tchikachas," contemporary transcript by Alexandre de Batz. There is also an unsigned manuscript copy in L'atlas Moreau de Saint Méry (F3 290 12), Directions des Archives de France, Aix-en-Provence.

Size of the original: 51 × 34.5 cm. Photograph courtesy of the Archives des Colonies, Archives Nationales, Paris (C/13/a/22, fol. 67).

Mougoulachas “drew maps of the entire region, indicating that Tonty traveled to the Ouma village after departing their own.”¹⁷⁵ Iberville knew that ten years earlier Henri de Tonty had descended the Mississippi as far as the head of the Delta. The information the Indians gave Iberville may have assured him that he was on the Mississippi, but it also worried him. He wanted to return to the sea, since his provisions were running short and his mission to establish a French colony near the mouth of the Mississippi was not yet accomplished. Yet he also wanted to travel farther inland to establish the course of the river and pinpoint his exact whereabouts.

Iberville’s journal contains other references to Indians’ making and using maps. He showed them printed maps in an attempt to confirm the existence of a supposed fork upstream, and he later commented that “Indians, especially those who drew maps for me could not have lied about the fork.”¹⁷⁶ On another occasion a warrior appears to have dissented, assuring Iberville that the Mississippi “does not divaricate,” and drawing “a map on which he indicated that during the third day of our journey, we shall encounter a river on the left [west] bank, called the Tassénocougoula [probably Red River], which has two branches. Eight villages, which he named . . . are situated along the western tributary.”¹⁷⁷ The map was made in partial response to Iberville’s questions concerning Henri de Tonty’s exploration down the Mississippi. Iberville, pursuing his country’s geopolitical strategy to open up the Mississippi Valley from the south to prevent incursions by English traders from the east, was using Indians to make maps in order to verify position and establish links across a terra incognita with places to the north already known to the French. One suspects that many similar occurrences in the Southeast were either unrecorded or reported but since lost, though why they are less numerous than in other regions is unclear.

BOUNDARIES AND MAPPING

The delineation of boundaries by colonial authorities, which included boundaries between native groups, together with existing geographic knowledge among southern Indians, caused late eighteenth-century southern Indians to become increasingly aware of boundaries. These included boundaries separating one group’s hunting grounds from another’s as well as those separating Indian from colonial and, later, state and federal territory. De Vorsey notes:

Although it was seldom credited on the maps drawn to illustrate the various boundary surveys undertaken [at first by the English colonial authorities] with the co-operation of the southern tribes, it is probable that much of the supplementary detail included in them came from information provided by the Indian mem-

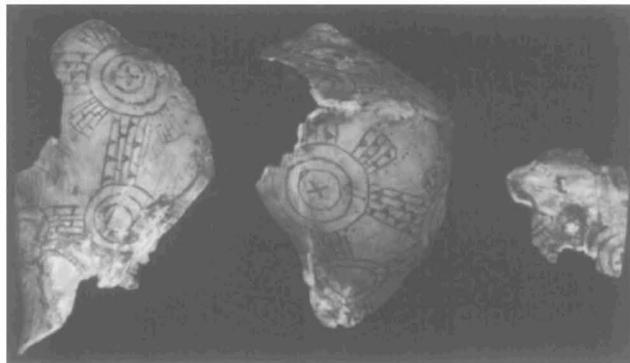


FIG. 4.42. CONCENTRIC CROSS-IN-CIRCLE MOTIF INTERCONNECTED GRID ENGRAVING ON A PREHISTORIC SHELL CUP. Mississippian period, ca. A.D. 900–1450, three fragments. Recently tentatively identified as a map of Mississippian sites and resource locations.

Size of the largest fragment: ca. 14 × 9 cm. Photograph courtesy of the Department of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM 448828, 448877, and 448880).

bers of the surveying parties. It would further seem probable that these same Indians, upon returning to the tribal council fires after the completion of these surveys, were quite capable of communicating the locations and significance of the new boundaries they had helped demarcate [in the field].¹⁷⁸

Among a group of documents relating to territorial disputes with Indians transmitted to the Senate by President George Washington on 7 August 1789 was a map providing evidence that some southeastern Indians drew boundary lines (fig. 4.43). The original had been drawn four years before by “Koatohee or Corn Tassel of Toqua [usually Chota],” the chief Cherokee negotiator at the Treaty of Hopewell, which established a boundary west of which settlement by people of European stock would be illegal. In his address to the commissioners of the United States, 23 November 1785, Corn Tassel remembered “giving our lands . . . in 1777.” He described in words the “lines” that had been transgressed on the ground by settlers. The commissioners then demanded of Corn Tassel “the boundary of your country; you must recollect yourself and give it to us, particularly the line be-

175. Carl A. Brasseaux, ed., trans., and annotator, *A Comparative View of French Louisiana, 1699 and 1762: The Journals of Pierre Le Moyne d'Iberville and Jean-Jacques-Blaise d'Abbadie* (Lafayette: Center for Louisiana Studies, University of Southwestern Louisiana, 1979), 47. According to Brasseaux’s footnotes, Bayogoulas (Choctaw for bayou people) were Muskogean, and Mougoulachas (also called Quinipissas) were culturally related to the Choctaws.

176. Brasseaux, *Comparative View*, 35 and 60.

177. Brasseaux, *Comparative View*, 56–57.

178. Louis De Vorsey, *The Indian Boundary in the Southern Colonies, 1763–1775* (Chapel Hill: University of North Carolina Press, 1966), 45–47, quotation on 47.

tween you and the citizens [settlers], with any information you have on that subject. If necessary, you may consult your friends, and inform us to-morrow, or as soon as possible with conveniency." Two days later, the "headmen, after some conversation together, requested the commissioners to give them some paper and a pencil, and leave them to themselves, and they would draw the map of their country." On the following day the Indians "produced their map, and the Tassel addressed the commissioners."¹⁷⁹ Both the map and the statements made by Corn Tassel and the several other headmen reveal a very precise understanding of linear boundary. Furthermore, the actual boundary passed through some of the most mountainous terrain of the southern Appalachians, crossing obliquely the upper reaches of many streams, some of which drained eastward to the Atlantic and others westward into the Ohio-Mississippi Valley. Hence no part of the boundary could follow either a river course or a linear watershed.

Corn Tassel had been involved in land negotiations for at least "eighteen springs."¹⁸⁰ His concept of boundary, the ability to relate it to actual terrain and drainage networks, and the skill to draw boundary lines on maps had almost certainly developed in the course of these negotiations. There is no indigenous evidence in either the Southeast or other parts of North America to suggest that Indians drew boundary lines on maps before they began to enter into land negotiations with governments and settlers.¹⁸¹ Indeed, before such negotiations, there had been no need to do so. It would have been contrary to a deeply felt and continentwide belief later expressed by the Nez Percé Chief Joseph (Hin-mah-too-yah-lat-kekht) that "the country was made without lines of demarcation, and it is no man's business to divide it."¹⁸²

FAR WEST

Indians from four culture groups (Southwest, Northwest Coast, Plateau and Basin, and California) inhabited North America west of the Plains and Subarctic. Their cultures and means of subsistence varied substantially, as did the timing and circumstances of their contact with Europeans. They are treated together here because of the small number of surviving artifacts and accounts of mapmaking from the region as a whole, although each culture group is represented. Some of the intraregional variation may be due to cultural characteristics of Indian groups. For example, there are very few examples of indigenous mapmaking from California. Since most of its Indians occupied relatively small territories and were organized in small nuclear families (as distinct from the extended families that characterized most of the continent), it could be that they had less need to communicate with maps. There are, however, sufficient records to indicate that even here

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FIG. 4.43. CORN TASSEL'S MAP. In this case and others, the rarity of peaked summits, as distinct from conspicuous long, even ridge crests, may have caused confusion in Indian-settler disputes about land agreements. The boundary they were attempting to negotiate was more than six hundred kilometers long but was delimited on their map as intersecting sixteen very generalized rivers and connecting three mountains. None of the river intersections were at confluences, sources, settlements, distinctive natural features, or other kinds of establishable sites. Of the three mountains, one was 9.6 kilometers south of an unestablishable intersection with a river. If the region's mountains had been sharp peaks rather than long smooth ridges, they could have served as precise referents, but only two were named. "This map is copied from one drawn by the Tassel and some other of the Head men of the Cherokees to describe their territorial claims . . . Keeowee the 28th of Nov^r 1785." Ink on paper. Size of the original: ca. 43 × 36 cm. Photograph courtesy of the National Archives, Washington, D.C. (Senate 1A-E4).

some of them did so.¹⁸³ Perhaps because they were only sparsely populated and contained few resources, there is little evidence of maps and mapmaking in the extensive high mountain regions of the Rocky Mountains and Sierra Nevada. Some groups may have been more likely to map in ephemeral forms, such as the earth modeling techniques of the Indians of the Plateau and Basin. It is also certain that the circumstances of initial and continuing contact influenced the survival and knowledge of Indian maps. For instance, knowledge of cartographic elements in Navajo sandpainting, an ephemeral form practiced in some secrecy, exists because twentieth-century collectors and ethnographers were interested.

EARLY MAPPING ENCOUNTERS: SPANISH

Two very early records of mapmaking by North American Indians came as a consequence of Spanish *entrada* in

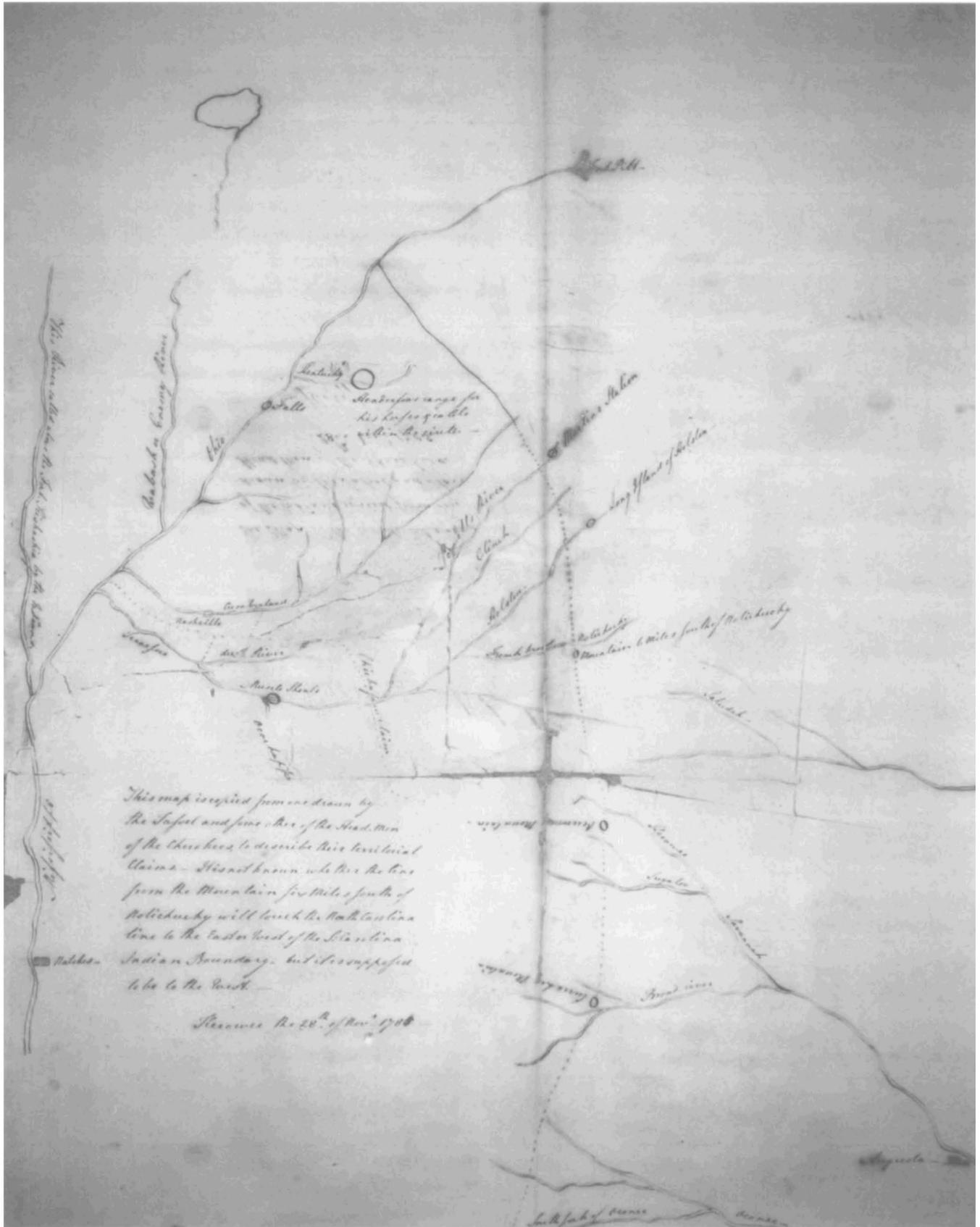
179. *American State Papers: Documents, Legislative and Executive, of the Congress of the United States*, Class 2, Indian Affairs, 1789–1827, 2 vols. (Washington, D.C.: Gales and Seaton, 1832), 1:42–43 (the engraved version of the map is on 40).

180. *American State Papers*, 1:41.

181. Boundaries exist, however, on cosmographical maps; see plate 5 and figs. 4.48 and 4.73. In part cosmographical, figure 4.57 also separates two spaces by means of a bold boundary.

182. T. C. McLuhan, comp., *Touch the Earth: A Self-Portrait of Indian Existence* (New York: Outerbridge and Dienstfrey, 1971), 54.

183. See, for instance, the maps made for Frémont in 1843 and 1844, pp. 113–14. Lieutenant Amiel Weeks Whipple reproduced as simple line engravings maps done on the ground by Southern Paiutes and Yumans in 1854: *Reports of Explorations and Surveys to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean*, 33d Cong., 2d sess., Sen. Ex. Doc. 78 (1856), vol. 3, pt. 3, p. 16. The two printed maps differed markedly from Whipple's manuscript copies of the ground maps: Whipple's Notebook 20, Oklahoma Historical Society, Oklahoma City (see below, note 360). Figure 4.103*b* below is derived from the Yuman map.



the Southwest. In September 1540 Hernándo de Alarcón, leader of the first group of Spaniards to reach what are now southeastern California and southwestern Arizona, ascended the Colorado River, reaching a point somewhere near what are now known as Quartz Peak and the Trigo Mountains. There he met an elderly, probably Halchidhoma, man who could not possibly have had previous contacts with Europeans.¹⁸⁴ Alarcón, wishing to obtain information concerning conditions upstream, “told him” (it is not explained how he communicated) “that I would not ask another question other than that he mark on a piece of paper what he knew of that river, and what people lived on both of its banks. He accepted with pleasure.”¹⁸⁵ Whatever the procedure might have been, it is almost certain that on his very first contact with Europeans the Indian made a map of the Colorado River for an unspecified distance above the point reached by Alarcón and that he did so willingly.

Also in New Mexico in 1540, Francisco Vásquez de Coronado, in search of the Seven Cities of Cibola (as a group of Zuni pueblos had been misidentified by the Spanish), arrived at a Zuni settlement, probably Hawikuh. He wrote:

In this one where I am now lodged there are perhaps 200 houses, all surrounded by a wall, and it seems to me that, together with the others, which are not so surrounded, there might be in all 500 hearths.

There is another town near by, which is one of the seven, but somewhat larger than this, and another of the same size as this; the other four are somewhat smaller. I am sending a sketch of them all, and of the route, to your Lordship [Antonio de Mendoza, viceroy of New Spain]. The skin on which the painting is made was found here with other skins.¹⁸⁶

This account does not clarify whether the skin was painted before or after Coronado found it, but the Spaniard noted that “the natives here have some very well-dressed skins, and they prepare and paint them where they kill the cattle.”¹⁸⁷ Though not referred to as a map, the painting was certainly interpreted as one, though whether it was done with the help of an Indian is not known.

As happened with the English, maps sketched on the ground for the Spaniards were part of the earliest encounter process. Marcos Farfán de los Godos, in what is now Arizona, seeking information about three rivers he had crossed in the fall of 1598, gathered together a large group of Yavapai Indians. Making “a sketch on the ground with a stick,” they explained that the “three rivers and two others which joined them farther on, five in all, flowed together through an opening” to become a wide river with “numerous settlements of people who planted extensive fields of maize, beans, and calabashes in a very

level country of fine climate.”¹⁸⁸ It was the first indication the Spaniards had received of the Pima agricultural settlements in the lower valley of what they later and very appropriately named the Verde River. Inscribing in this way may have been resorted to frequently in the early contact period, when spoken language was inadequate for communicating geographical information to Euro-Americans.

RITUAL AND COSMOGRAPHIC MAPS

Failure to recognize that terrestrial and cosmographical content might coexist on one map caused Francisco de Escobar some reservations about reporting such content in his relation of an experience on the lower Colorado River in 1604 or 1605. Otata, a chief of the Bahacechas (Vacechas)¹⁸⁹ had told him of the peoples who lived on the lower Colorado River and around the Gulf of California “making a sketch of the land on a piece of paper, in which he indicated many nations of people so strange that only at great risk of not being believed do I venture to report these things.”¹⁹⁰ As an educated Renaissance man, Escobar was cautious about improbable but assumedly real phenomena he could not verify. Among the peoples Otata told of were those “whose men had virile members so long that they wound them four times around the waist”; those “whose people had only one foot”; and those “who dwelt on the shore of a lake, and . . . slept under the water.”¹⁹¹ The people who slept beneath the waters of the lake were almost certainly a form of the water sprites

184. Vásquez de Coronado had reached the pueblo complex of Cibola only two months before, and that was in a quite different culture region more than five hundred kilometers to the east across difficult terrain. In the previous year Francisco de Ulloa had briefly reached the mouth of the Colorado River by sea but made no attempt to ascend it. The nearest sparsely settled Spanish territory, New Galicia, was more than one thousand kilometers to the southeast across the Sonoran Desert. William H. Goetzmann and Glyndwr Williams, *The Atlas of North American Exploration: From the Norse Voyages to the Race to the Pole* (New York: Prentice-Hall, 1992), 36–39.

185. George Peter Hammond and Agapito Rey, eds. and trans., *Narratives of the Coronado Expedition, 1540–1542* (Albuquerque: University of New Mexico Press, 1940), 153. The incident was also reported in Hakluyt, *Principal Navigations*, 9:315 (note 60).

186. Hammond and Rey, *Narratives of the Coronado Expedition*, 170–71.

187. Hammond and Rey, *Narratives of the Coronado Expedition*, 173.

188. George Peter Hammond and Agapito Rey, eds. and trans., *Don Juan de Oñate: Colonizer of New Mexico, 1595–1628*, 2 pts. (Albuquerque: University of New Mexico Press, 1953), pt. 1, 412.

189. Virtually nothing certain is known about the Bahacechas (or Vacechas). Kroeber says: “Along the Colorado from the Gila to the ocean all the Colorado nations were like the Bahacechas in dress and speech—that is, Yumans” (A. L. Kroeber, *Handbook of the Indians of California*, Bureau of American Ethnology Bulletin 78 [Washington, D.C.: United States Government Printing Office, 1925], 802).

190. Hammond and Rey, *Don Juan de Oñate*, 2:1024 (note 188).

191. Hammond and Rey, *Don Juan de Oñate*, 2:1025.

characteristic of the lore of Great Basin peoples. The Washoes still believe that sprites live at the bottom of Lake Tahoe, and people with one foot, mentioned by Otata, are also part of Washoe lore.¹⁹²

Indians of the Southwest produced the best-known and most carefully observed examples of ritual maps incorporated in sandpaintings (also known as ground paintings and dry paintings). Some of the repertoire of formal sandpaintings incorporated celestial and terrestrial elements. Although the form was best known among the Navajos, the oldest sandpainters may well have been the Hopis and other Apachean speakers of Uto-Aztec languages in the Southwest.¹⁹³

Among the Navajos, the creation of sandpaintings was a part of rituals performed to restore health and secure blessings. The Navajo world consisted of two classes of people: Earth (human) People and Holy (supernatural) People. The universe functioned according to rules that both the Earth People and Holy People had to observe, and when the rules were not followed there would be disease and accidents. According to the precise nature of a disaster, a very formal ritual would be performed asking the Holy People to restore the balance in the universe. Sandpaintings, accompanied by the appropriate chant, were an important part of these rituals. On the floor of a hogan, a medicine man “painted” intricate traditional patterns by dexterously sprinkling appropriately colored dried, pulverized substances on a bed of sand. Several paintings might be made in the course of a chant, and paintings varied according to the chanter’s interpretation. The sandpaintings were not permanent. None of the paintings were entirely cartographic, but some incorporated map elements.

Stars and constellations are common and important components of Navajo sandpaintings made in the course of chantway ceremonies. Griffin-Pierce classifies the depiction of stars and constellations into ten visual formats: Father Sky (with/without Mother Earth); night sky; stars reflected in oceans; the skies; as background/with people; earth and sky (not as figures); individually; in summer and winter skies; big stars; and star map.¹⁹⁴ Figure 4.44 shows stars depicted within the figure of Father Sky. The prominence of stars varies in different formats, and some paintings depict single stars rather than constellations.

An interesting, though not representative, work exists in the form of a drawing made by the early twentieth-century singer Sam Chief. Unlike other known sandpaintings, it represents only stars and constellations, with stars painted according to two or three orders of magnitude (figs. 4.45 and 4.46). Because of Sam Chief’s unorthodox use of color and format, other chanters have

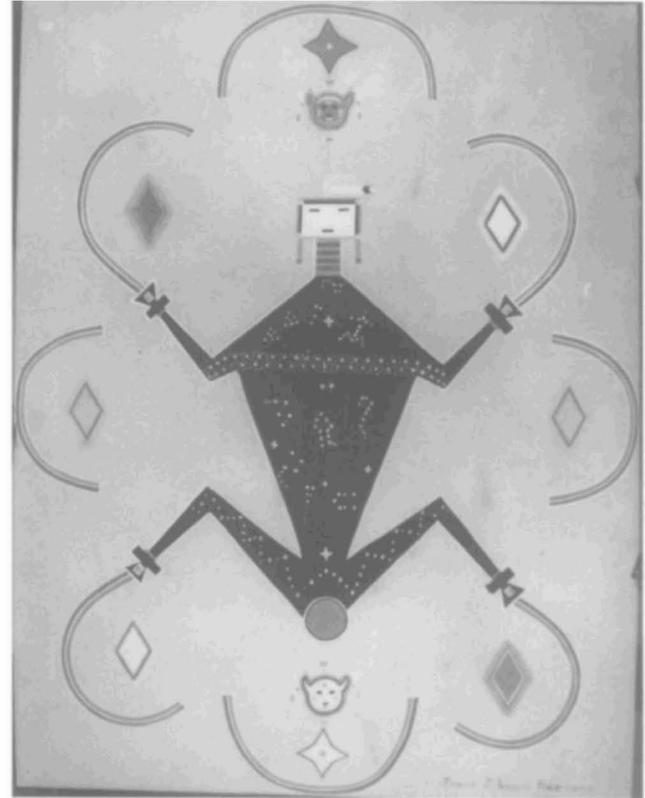


FIG. 4.44. THE CELESTIAL COMPONENT OF A NAVAJO SANDPAINTING. “Father Sky,” 1935–36, painted by Franc J. Newcomb in 1953. East is at the top. The Milky Way stretches between the elbows, Venus is the bright star centered above the Milky Way, and the Pleiades is just above Venus. Polaris and Corvus are within the torso. Newcomb reproduced in sketches and paintings like this one hundreds of sandpaintings after witnessing the creation of the originals. Photograph courtesy of the Wheelwright Museum of the American Indian, Santa Fe, New Mexico (P8 no. 16).

vant (Washington, D.C.: Smithsonian Institution, 1978–), 11:641–59, esp. 653 and 655.

193. Gordon Brotherston, *Image of the New World: The American Continent Portrayed in Native Texts* (London: Thames and Hudson, 1979). Brotherston claims that “Mide writing [pictography] and Southwestern sandpainting, have a close affinity with the pre-Columbian scripts of Mesoamerica—Toltec and Maya” (17); and more specifically, that the sandpaintings of the Southwest are related to the Toltec screenfolds (65). “Athapaskans who emigrated from the Pacific Northwest, like the Apache [and] the Navajo are not the oldest practitioners of Southwestern sandpainting. That privilege belongs more likely to the Hopi and other relatives of the Nahua-speakers in the area” (98). Because of its ephemeral nature, almost nothing is known about the origin and evolution of sandpainting. More specifically, we do not know when cartographic components began to appear in the paintings. Brotherston’s observations do, however, lead to a tentative hypothesis that sandpaintings may afford a link between what have hitherto been tacitly accepted as the different traditional cartographies of North America and Mesoamerica.

194. Trudy Griffin-Pierce, *Earth Is My Mother, Sky Is My Father: Space, Time, and Astronomy in Navajo Sandpainting* (Albuquerque: University of New Mexico Press, 1992), 104–26.

192. Sven Liljeblad, “Oral Tradition: Content and Style of Verbal Arts,” in *Handbook of North American Indians*, ed. William C. Sturte-

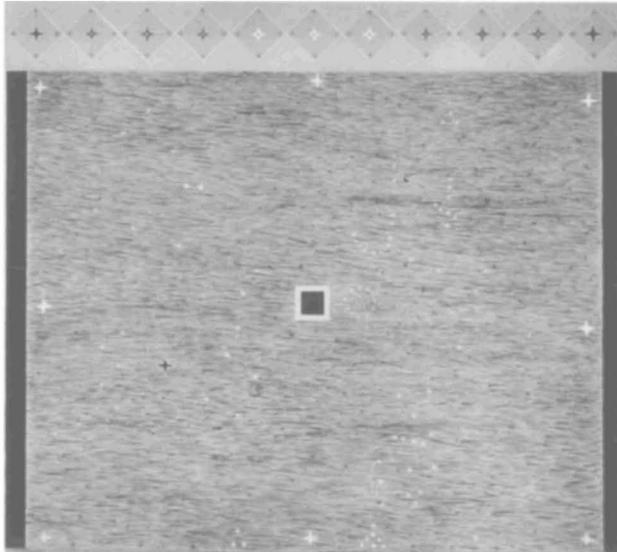


FIG. 4.45. DRAWING OF A NAVAJO SANDPAINTING, "THE SKY," BY YELLOW SINGER (SAM CHIEF), 1910–18. Copy by Clyde A. Colville. This may not have been traditional, because with the exception of "Opening beyond the Stars" at the center its content is entirely celestial. Sandpaintings normally have strong cosmographical content. Photograph courtesy of the Wheelwright Museum of the American Indian, Santa Fe, New Mexico (P8B no. 14).

questioned whether this and other drawings he made for the collector Louisa Wade Wetherill were really traditional sandpaintings. Leland Wyman suggests that he may have been inspired to innovate by the materials Wetherill supplied, or that he might have changed the designs to avoid human or supernatural reprisal for revealing sacred rituals.¹⁹⁵

Celestial mapmaking was particularly important in sandpaintings associated with the Navajos' Male Shootingway. The chant commemorates an event in which the sun was visited by earth children. The sun instructed them in the arts of healing, of which making sandpaintings, including those of the sky, was an important part. The sandpainting known as "The Skies" depicts the sky at dawn, day, twilight, and night, each enclosed in a rectangle or trapezoid (plate 5). Stars, constellations, the Milky Way, sun, and moon are all depicted in the night sky (at the top of the painting), but in the eight versions Reichard and Newcomb collected the positions of these elements varied. The stars were represented as they appeared at the time the chant was sung; since Navajo ritual was not calendrical but was associated with needs, this could be at virtually any time of the year.¹⁹⁶

Terrestrial features were also depicted in sandpaintings, generally landforms that were believed to be endowed with power. They were sometimes represented three-dimensionally, with heaped-up sand or clay cones for mountains and dishes or bottle caps sunk in the ground for lakes.¹⁹⁷ Among the Navajos, each of the four cardinal

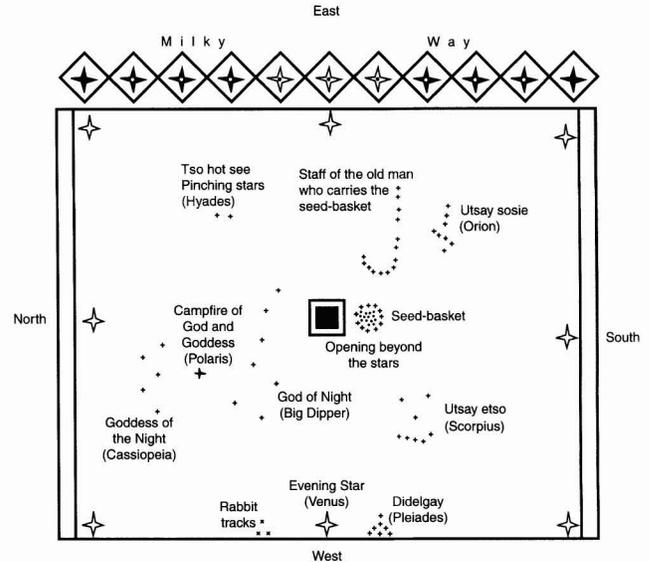


FIG. 4.46. INTERPRETATION OF "THE SKY" (FIG. 4.45).

directions was associated with a mountain and a time of day, which in turn were symbolized by a stone or shell and a color: south, Mount Taylor, associated with noon and planning power and symbolized by turquoise and the color blue; west, San Francisco Peaks, associated with twilight and life power, symbolized by abalone and gold; north, Hesperus Peak, associated with night and faith, symbolized by jet and black; and east, Blanca Peak, associated with dawn, birth, and thought, symbolized by white shell and the color white.¹⁹⁸ The sacred mountains and their associations are the same for every Navajo pueblo irrespective of location. Color was particularly important in representing the cardinal directions in sandpaintings. Most Navajo sandpaintings are oriented with north at the top of the square, though not infrequently east is in that position. This characteristic also gives structure to cosmographical paintings incorporating terrestrial as well as celestial and mythical components. The key terrestrial components are the four sacred mountains, but other places associated with cosmographical events are also included.¹⁹⁹

195. Griffin-Pierce, *Earth Is My Mother*, 120–22, and Leland C. Wyman, *Southwest Indian Drypainting* (Santa Fe, N.Mex.: School of American Research, 1983), 274–75, who also suggests that Sam Chief's style might represent a regional variation. Griffin-Pierce feels "they are probably not accurate reproductions of ceremonial sandpaintings" (121).

196. Franc J. Newcomb and Gladys A. Reichard, *Sandpaintings of the Navajo Shooting Chant* (New York: J. J. Augustin, 1937; reprinted New York: Dover, 1975), 58–59, and Gladys A. Reichard, *Navajo Medicine Man: Sandpaintings and Legends of Miguelito* (New York: J. J. Augustin, 1939; reprinted New York: Dover, 1977), 43–44 (fig. 2).

197. Griffin-Pierce, *Earth Is My Mother*, 52–53 (note 194).

198. Jimmie C. Begay, "The Relationship between People and the Land," *Akwesasne Notes* 11, no. 3 (1979): 28–29 and 13.

199. Griffin-Pierce, *Earth Is My Mother*, 53, 70–72, and 88–96 (note 194).

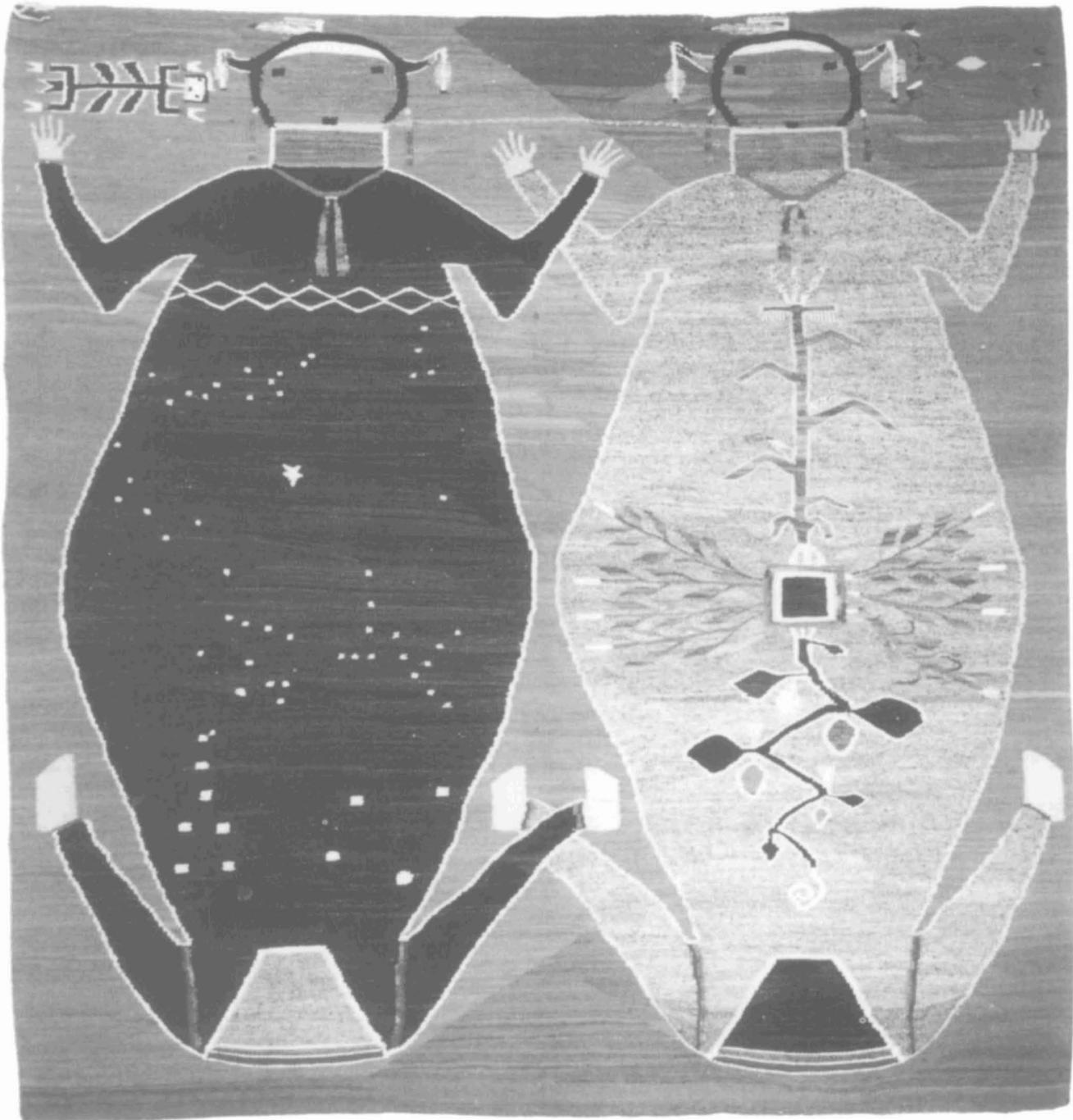


FIG. 4.47. FATHER SKY, INCORPORATING CONSTELLATIONS AND STARS, AND MOTHER EARTH IN A NAVAJO WOVEN RUG, BEFORE 1930. This is an example of an image's being transferred from a traditional medium (sandpainting) to a commercial medium (woven rug).

Size of the original: 166 × 160 cm. Photograph courtesy of the Wheelwright Museum of the American Indian, Santa Fe, New Mexico (44/517).

In 1919 a Navajo medicine man, Hosteen Klah, began weaving sandpainting patterns in rugs and later taught the craft to his nieces.²⁰⁰ A rug woven by one of the women in the 1920s or 1930s affords a good example of cartographic representation in commercial art (fig. 4.47). It depicts Father Sky and Mother Earth; the former in-

corporating the stars and constellations much as in figure 4.44.

Some of the Indians of southern California also prac-

200. Susan McGreevy, "Navajo Sandpainting Textiles at the Wheelwright Museum," *American Indian Art Magazine* 7 (1981): 54–61.

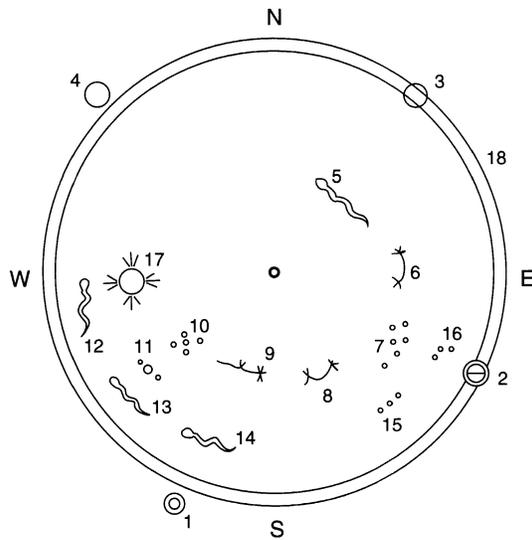


FIG. 4.48. REDRAWING OF A GROUND PAINTING OF THE CELESTIAL WORLD MADE BY MANUEL LACUSO, A DIEGUEÑO INDIAN, CA. 1900. The painting represented three major topographical features and one unidentified feature at or near the circular horizon as perceived from the Santa Ysabel region of southern California: (1) Atoloi, witch mountain on an island, identified by the informant with Coronado Island; (2) Nyapukxaua, mountain where people were created (unidentified and perhaps cosmographical); (3) Wikaiyai, San Bernardino Mountain (probably San Gorgonio Peak); and (4) Axatu, Santa Catalina Island. In addition, constellations and stars are shown (5–18, others are missing because the painter had forgotten their locations): (5) Awī, rattlesnake; (6) EteekurLk, wolf; (7) Xatea, Pleiades; (8) Namul, bear; (9) Nyimatai, panther; (10) “Cross star”; (11) Saīr, buzzard star; (12) Xawitai, grass snake or blue garter snake; (13) Xilkaīr, red racer snake; (14) Awiyuk, gopher snake; (15) Watun, “shooting” constellation; (16) Amu, mountain sheep, three stars of Orion; (17) spitting hole, diameter about twenty centimeters (not a topographical feature, but a place on the map in which young boys were to spit—missing predicted a short life); (18) Horizon, forming the visible limits of the earth.

After T. T. Waterman, “The Religious Practices of the Diegueño Indians,” *University of California Publications in American Archaeology and Ethnology* 8 (1908–10): 271–358, esp. pl. 24.

ticed sandpainting. According to A. L. Kroeber, this practice originated in the more complex ceremonialism of the Pueblos and Navajos.²⁰¹ In many of their sandpaintings, the Luiseños and Diegueños represented their world as circular. The circle represented the horizon. Within it were celestial, mythical, and terrestrial features. One such painting, done at the beginning of the twentieth century by an old Diegueño man of Santa Ysabel, placed four small circles on or near the horizon circle: Coronado Island, Santa Catalina Island, San Bernardino Mountain (probably San Gorgonio Peak), and Mountain of Creation (unidentified) (see fig. 4.48). Kroeber interpreted

Diegueño ground paintings geographically, as presenting “a downright map of the mundane surface and the celestial sphere.”²⁰² Kroeber does not comment on the significance of cosmographic features portrayed on the map such as the “mountain where people were created.”²⁰³

MODELED MAPS

In addition to maps representing the cosmos, there are many accounts of maps made for more mundane, practical reasons. Nootkas of the Pacific Northwest Coast made a map on a beach in Clayoquot Sound on the west coast of Vancouver Island in preparation for attacking the village on Acktis Island, 150 kilometers to the north:

The meeting adjourned to a smooth untrodden sand-beach in the neighbourhood. Here Quartsoppy, a Klah-oh-quaht, whose wife was a Ky-yoh-quaht woman [of the village to be attacked], was directed [by the chief] to describe on the sand the Island of Ocktees, on which the village of the Ky-yoh-quahts was placed. He immediately set to work and drew an outline of the island, then showed the coves, beaches, tracks; next the village with the different houses, divisions, and sub-divisions—referring now and then for confirmation to other natives who also knew the locality. Small raised piles of sand represented houses, one of which was Nancie’s, the chief of the Ky-yoh-quahts, another belonged to Moochinnick, a noted warrior; others to chiefs of inferior repute. Quartsoppy, referring to his drawing, also showed, or otherwise informed his audience of the usual number of men in each division of the camp, their arms and supposed ammunition, the characteristics of the principal men, as their youth, age, courage, activity, or strength.

All this time the warriors . . . stood round the delineator in a large circle, and questions were asked and eager conversation held. After several speeches had been made, a general plan of attack proposed by Setanim [the chief] was adopted.²⁰⁴

At or near Honey Lake, California, sometime before 1850, an elderly Northern Paiute, responding to a request for information about a reported source of gold in a region that was still virtually unknown to Euro-Americans,

took a pair of macheres [loose covers for a saddle] and

201. Kroeber, *Indians of California*, 661 (note 189).

202. Kroeber, *Indians of California*, 664.

203. See T. T. Waterman, “The Religious Practices of the Diegueño Indians,” *University of California Publications in American Archaeology and Ethnology* 8 (1908–10): 271–358, esp. 350–51 (pl. 24 and explanation).

204. Gilbert Malcolm Sproat, *Scenes and Studies of Savage Life* (London: Smith, Elder, 1868), 191–92. A later annotated edition indicates this event occurred in 1855: Gilbert Malcolm Sproat, *The Nootka: Scenes and Studies of Savage Life*, ed. and annotated Charles Lillard (Victoria: Sono Nis Press, 1987), 127.

sprinkled sand over them, drew a model map of the country there, and beyond it, some distance. He heaped up sand, to form buttes, and ranges of mountains; and with a straw, drew streams, lakes, and trails: then adjusted it to correspond with the cardinal points, and explained it. He pointed to the sun, and by signs made them understand, the number of day's travel from one point to another. On it he had traced, (as I found on their explanation,) Mary's river, Carson river, Pyramid lake, and the emigrant routes,—above and below. He moved his finger, explanatory of the revolutions of wagon wheels, and that white people travelled along, with guns, on the said routes [almost certainly the several variant routes used by gold seekers in 1849 in traveling by land to California]. On his map, he had exhibited the lake they were then at [Honey Lake], and another in a deep basin, with 3 buttes beside it [probably Gold Lake, some forty miles to the south-southwest], and said that gold was plentiful there.²⁰⁵

Although this particular case of modeling may not have been as elaborate as that of the Clayoquot group of Nootkas on the west coast of Vancouver Island, the Indians of the Great Basin made particular use of this medium. There was no suitable bark, animal skins were precious, but surficial materials were ubiquitous in the semiarid and often rocky environments. Like the one made near Honey Lake, their maps may have represented large areas because they lived in seminomadic bands and ranged over extensive territories.

In 1871 a party of George M. Wheeler's expedition was at Grapevine Springs, north of Death Valley, near the southwest edge of the Great Basin. Dr. W. J. Hoffman, an acting assistant surgeon, described how a Southern Paiute living there

informed the party of the exact location of Las Vegas, the objective point. The Indian sat upon the sand, and with the palms of his hands formed an oblong ridge to represent Spring Mountain, and southeast of this ridge another gradual slope, terminating on the eastern side more abruptly; over the latter he passed his fingers to represent the side valleys running eastward. He then took a stick and showed the direction of the old Spanish trail running east and west over the lower portion of the last-named ridge.

When this was completed the Indian looked at the members of the party, and with a mixture of English, Spanish, Pai-Uta, and gesture signs, told them that from where they were now they would have to go southward, east of Spring Mountain, to the camp of Pai-Uta Charlie, where they would have to sleep; then indicating a line southeastward to another spring (Stump's) to complete the second day; then he followed the line representing the Spanish trail to the east of the divide of the second ridge above named, where he left it, and passing northward to the first valley, he

thrust the short stick into the ground and said, "Las Vegas."²⁰⁶

OTHER EPHEMERAL MAPS

Within the Great Basin, not all maps were modeled or even made on the ground. Other forms of ephemeral maps were encountered here and throughout the Far West. The Yavapais who sketched the map for Marcos Farfán de los Godos in 1598 were from just outside its southern limit, in the Southwest culture region. In the opposite direction, the Klamaths, who in 1843 drew for Frémont "upon the ground" part of the complex drainage catchment of the Klamath River, were from just outside its northwestern limit, in the Plateau culture region.²⁰⁷ In 1769, just outside the Great Basin to the southwest, members of the Fernandeano group of the Gabrielinos "drew on the ground" for Father Juan Crespi and Miguel Costansó, members of Gaspar de Portolá's expedition, "the shape of the [Santa Barbara] channel with its islands, marking the route of the [Spanish] ships."²⁰⁸

A map described by John C. Frémont included part of California as well as the Great Basin. At the beginning of 1844 he was trying to obtain information about possible routes westward through the northern Sierra Nevada to northern California. Near the inflow of the Truckee River into Pyramid Lake near the northwestern edge of the Great Basin he was unsuccessful in attempts to obtain information from a group of Northern Paiutes, until they began to make

on the ground a drawing of the river, which they represented as issuing from another lake in the mountains three or four days distant, in a direction a little west of south; beyond which, they drew a mountain; and further still, two rivers; on one of which they told us that people like ourselves travelled. Whether they alluded to the settlements on the Sacramento, or to a party from the United States which had crossed the Sierra about three degrees to the southward, a few years since, I am unable to determine.²⁰⁹

205. Georgia Willis Read and Ruth Gaines, eds., *Gold Rush: The Journals, Drawings, and Other Papers of J. Goldsborough Bruff*, 2 vols. (New York: Columbia University Press, 1944), 2:925; see also 2:1098–99 n. 11.

206. Mallery, "Pictographs of the North American Indians," 157–58 (note 4).

207. John C. Frémont, *Report of the Exploring Expedition to the Rocky Mountains in the Year 1842, and to Oregon and North California in the Years 1843–'44* (Washington, D.C.: Blair and Rives, 1845), 206.

208. Herbert Eugene Bolton, ed., *Fray Juan Crespi: Missionary Explorer on the Pacific Coast, 1769–1774* (Berkeley: University of California Press, 1927; reprinted New York: AMS Press, 1971), 151; see also Frederick John Teggart, ed., *The Portolá Expedition of 1769–1770, Diary of Miguel Costansó* (Berkeley: University of California Press, 1911), 25.

209. Frémont, *Report of the Exploring Expedition*, 219 (note 207).

In the following year, Frémont was to follow this route.

In 1834, near what was to become Yellowstone Park, a North Shoshone “drew a map of the country around us on a white Elk Skin with a piece of Charcoal.”²¹⁰ It almost certainly represented the area to the north of Yellowstone Lake, its canyons, and the open section of the valleys around what is now Livingstone, as well as one of the Yellowstone River’s tributaries, the Lamar. Interestingly, no reference is made in the account of the map to the thermal springs and spectacular mineralized features near the center of what was to become the park. From the perspective of traditional cartography, however, the significance is twofold: it is a rare example of an Indian map from within the Rocky Mountains and, although Great Basin in terms of culture, one almost certainly influenced by the traditional cartography of the Plains region immediately to the east.

Another map of part of the Rocky Mountains was made in 1863 by a Shuswap woman for two lost English adventurers. Like the elkskin map, it was of rivers and routes through very rugged terrain. Unfortunately, nothing more is known about it than that it was a route map and was “traced” and “rude.” By inference from the text, it probably represented the upper Fraser and Canoe Rivers and the Thompson River from its source down to Kamloops.²¹¹

THE LEWIS AND CLARK EXPEDITION

The Lewis and Clark expedition of 1804–6 passed through the Plateau culture region in what now comprises Montana, Idaho, Washington, and Oregon. The journals often mention Indians making maps. The most authoritative published edition reproduces eight of these, cautiously consolidating them in the atlas volume as “Sketches from Indian Information” and not as “Indian Maps.” The reason given is that

some of the Indian sketches were no more than rude drawings on animal skins or stick scratches in the dirt to show rivers, with small mounds of earth piled up to represent mountains. Perhaps a number of the native drawings were never transferred to paper, and today not one of them exists in its original form. What we have in available maps is a combination of shared knowledge. Terrain was recorded on paper from the actual observations of the Corps [of Discovery], with peripheral areas added on the basis of data supplied by the most reliable Indian informants the Captains [Meriwether Lewis and William Clark] could quiz along the trail.²¹²

In total, however, the “peripheral areas” were enormous. Clark’s final cartographic compilation contains considerable topographic and hydrographic information for vast areas between the traverses and to the north and south of

them.²¹³ Incorporations of Indian information was far more frequent and embraced much larger areas than has been generally recognized, but it is often difficult to distinguish between European and Euro-American, native, and modified inputs.

Stylistically, too, it is difficult to pinpoint Indian contributions. Observations on terrain representation based mainly on transcripts can never be the foundation for firm conclusions. For example, several of the transcripts of Indian maps made by Lewis and Clark have linear sequences of hill-in-profile pictographs not dissimilar to those on the extant copies of maps by Ki oocus (fig. 4.62 below) and of Meatonabee and Idotlyazee (fig. 4.81 below), but they are remarkably similar to the terrain representations on many of the sketch maps made by Lewis and Clark themselves. Since the explorers merely made traverses, however, with remarkably few lateral journeys, it is arguable that most of the content of their sketch maps was derived from unacknowledged Indian information.²¹⁴ The evidence is inconclusive.

A rare North American example of a cartographic artifact on horn or bone is also associated with the Lewis and Clark expedition. There is a tradition that Sacagawea, the Shoshone wife of a member of the Lewis and Clark expedition, made an engraving on moose antler that had maplike qualities (fig. 4.49). The supposed cartographic component is a sequence of 112 drilled holes approximately paralleling the distal and lateral edges of the antler, with approximately every tenth hole larger than its neighbors. According to the tradition associated with the extant artifact, the sequence represents the progress of the expedition as experienced by Sacagawea. The

210. Aubrey L. Haines, ed., *Osborne Russell’s Journal of a Trapper* (Portland: Champoe Press for Oregon Historical Society, 1955), 27.

211. William Fitzwilliam Milton and Walter B. Cheadle, *The Northwest Passage by Land*, 8th ed. (London: Cassell Petter and Galpin, 1875), 262.

212. Gary E. Moulton, ed., *The Journals of the Lewis and Clark Expedition*, 8 vols. (Lincoln: University of Nebraska Press, 1983–93), 1:10–11.

213. William Clark, A Map of Part of the Continent of North America (1810), manuscript, 73.7 × 129.5 cm, William Robertson Coe Collection, Yale University. Reproduced in Moulton, *Lewis and Clark Expedition*, vol. 1, map 125.

214. See James P. Ronda, “‘A Chart in His Way’: Indian Cartography and the Lewis and Clark Expedition,” in *Mapping the North American Plains: Essays in the History of Cartography*, ed. Frederick C. Luebke, Frances W. Kaye, and Gary E. Moulton (Norman: University of Oklahoma Press, 1987), 81–91. Most of the maps relating to the expedition are reproduced in Moulton, *Lewis and Clark Expedition*, vol. 1 (atlas). The lines of hill-in-profile symbols on, for example, “Sketch given us May 8th 1806 by the *Cut Nose*, and the brother of the *twisted hair*,” and “This Sketch was given by Sundry Indians of the Chopunnish Nation together on the 29th 30th and 31st of May 1806 at our Camp on the Flat Head River” (maps 98 and 101) are not significantly different from those on the explorers’ own route maps (e.g., maps 75 and 104).

holes, however, are not arranged in a pattern that even approximates the geometry of the route, a round-trip journey of 498 days, in which the return trip was nearly 50 percent different from the outgoing one. The holes are too few to have recorded each day of the expedition and too many to have recorded the number of lunar months. They could have been a record of the number of camps, but that does not explain the larger holes or their fairly regular spacing. If the drilled moose antler is genuine and was made by Sacagawea to record her progress on the expedition, it seems much closer in function to mnemonic devices for recalling sequences of stopping places than to records of the route connecting them.

OTHER MAPS ON PAPER

The larger of two maps made in 1869 by Kohklux, a Chilkat chief from the Northwest Coast culture area, represented the route he took with his father in 1852 from the Chilkat River in northern British Columbia to attack and burn Fort Selkirk in the Yukon Territory (fig. 4.50). Drawing the map took him three days, assisted by his two wives, all “lying upon their stomachs making the drawing and discussing every feature.” Although “he had never held a pencil and paper before . . . [he] betrayed no sign of satisfaction but his wives were evidentl[y] exultant.”²¹⁵ The first part of the journey was through spectacularly glaciated mountains, and these appear to be depicted as profiles proportional to their mass and appearance as seen from adjacent valleys or plains. Sawtooth and occasional rounded profiles are named in what are presumably transliterations of Tlingit (Chilkat) toponyms. Furthermore, the profiles are shaded in pencil down to the level of the valley floor. For some reason, which might be apparent in the field, there are subtle gradations in the density of the shading (see detail, fig. 4.51). The general impression the map gives is of varying land form and mass.

Ishi, the last of the Yahis, drew a map of the northeastern part of California at the University of California, Berkeley, about 1914 (fig. 4.52). Essentially straight parallel rivers, rising in the Sierra Nevada, flow west into a straight, north-south oriented Sacramento River. There is some evidence that rivers separated native territories, for example, Battle Creek separating the Gari'sis (Galice) from the Southern Yanas and Butte Creek separating the Maidus from the Feather River Maidus. Even if this was the case, however, at least two of the creeks enter the territory of another group in their lower courses. Unfortunately these speculations cannot be tested on the evidence of the map alone. The original is not extant, and the published line drawing of 1925 has the characteristics of a period when clarity took precedence over authenticity and letter styles proliferated, often for no obvious reason.²¹⁶



FIG. 4.49. MOOSE ANTLER SUPPOSEDLY ETCHED WITH A RECORD OF A JOURNEY, PERHAPS 1805–6. Etched moose antler, with a series of drilled holes around its edge, said to have been made by the Shoshone Sacagawea, wife of Toussaint Charbonneau. Sacagawea accompanied her husband on the Lewis and Clark expedition and supposedly kept the antler as a record of the experience. Even if authenticated, this seems to be more a calendric record than a map. Current location unknown. Photograph courtesy of the University of California Library, Berkeley (Map Collection).

GREAT PLAINS AND CANADIAN PRAIRIES

The most distinctive cartographic artifacts among the Indians of the Plains are part of a rich tradition of pictorial depiction of historical and contemporary events in this region. Experiences of hunting and war were traditionally painted on animal hides, although all surviving pictorial works with maplike features were made after European contact. In the nineteenth century, men (figurative art was exclusively in the male domain) also made similar drawings on paper in watercolor or colored pencil, referred to generically as “ledger art” because the drawings were often made in notebooks.²¹⁷ Some of these records on hide or paper use cartographic principles to give spatial struc-

215. George Davidson, “Koh-Klux Map of 1869. first draft. Oct./97,” Davidson Papers, Bancroft Library, University of California, Berkeley, carton 8 (pp. 8–9). A transcript of the map, with a briefer account of its making, was later published: George Davidson, “Explanation of an Indian Map,” *Mazama* 2 (1900–1905): 75–82.

216. Kroeber, *Indians of California*, 344–46 (note 189). See also Theodora Kroeber, *Ishi in Two Worlds: A Biography of the Last Wild Indian in North America* (Berkeley: University of California Press, 1961), 215.

217. See *The Arts of the North American Indian: Native Traditions in Evolution*, ed. Edwin L. Wade (New York: Hudson Hills Press, 1986), especially Gloria A. Young, “Aesthetic Archives: The Visual Language of Plains Ledger Art,” 45–62. See also Janet Catherine Berlo, ed., *Plains Indian Drawings, 1865–1935: Pages from a Visual History* (New York: Harry N. Abrams in association with the American Federation of Arts and the Drawing Center, 1996), esp. 219. Although Plains Indians produced most of the pictorial maps, and by far the best ones, a few earlier examples are known from elsewhere. See, for example, figure 4.27 and also the account of the two transcripts of the Chickasaw map of about 1723, where it is conjectured that the presence of two pictographic drawings could be construed to mean the original contained more.

(Facing page)

FIG. 4.50. MAP MADE BY KOHKLUX AND HIS TWO WIVES OF HIS JOURNEY ACROSS THE COAST MOUNTAINS AND YUKON PLATEAU, 1869. Manuscript map in pencil with annotations in ink by George Davidson. Kohklux was a Chilkat (Tlingit) chief. "This map was drawn by Kohklux in 1869 at his village. It is the first time he ever used a pencil" (from endorsement on map). The map represents Kohklux's journey of seventeen years before; the outward and return routes between the Chilkat River, northern British Columbia, and Fort Selkirk, Yukon Territory. Kohklux and his father had taken the outward route in 1852 on their way to burn Fort Selkirk, some five hundred kilometers to the north. The first part of the journey of 1852 was through spectacularly glaciated mountains, hence the preponderance of serrated profiles in this part. If it can be demonstrated that the profiles do represent the views as seen from the valley floors, then they reflect remarkable feats of memory. Most of the route was to the north of Tlingit (of which the Chilkat were members) territory.

Size of the original: 109 × 67 cm. Photograph courtesy of the Bancroft Library, University of California, Berkeley (G4370 1852.K6 case XD).



FIG. 4.51. DETAIL OF THE SOUTH-CENTRAL SECTION OF FIGURE 4.50. This is the heavily, and in places actively, glaciated part of the Coast Mountains around the head of Lynn Canal. "Coal" (lower left) was perhaps the first indication of bituminous coal later to be proved in the area.

Size of the detail: ca. 28 × 26 cm. Photograph courtesy of the Bancroft Library, University of California, Berkeley (G4370 1852.K6 case XD).

ture to their message. Other maps on hide and paper, few in number but particularly interesting, appear to elucidate cosmographic beliefs about the relation between heaven and earth, although there is still much to learn about the provenance of these maps. As in other regions of North America, there is also a body of maps created in the process of contact and conquest, made at the request of explorers and surveyors or to document territorial claims.²¹⁸

PICTORIAL MAPS

The earliest known example of a pictorial work with cartographic elements is an eighteenth-century painted bison hide representing Indian warriors following a route to attack and defeat their enemies (plate 6). Although there is uncertainty about some of the places and events depicted, it shows

two feathered calumets, a battle between Indians, a scalp dance in which men and women are participating, four Indian villages, a French village or fort, and representations of the sun and moon. Above three of the villages are written the words Ackansas, Ouzovtovovi, Tovarimon, and Ovoappa. Ackansas (Arkansas), of course, is the generic name that the Illinois Indians (and thus the French) applied to the Quapaw Indians; the other words are the names of the three Quapaw villages of the eighteenth century.²¹⁹

The villages and fort are arranged around the two flanks and hindquarters of the skin; hence they are not planimetrically organized. They are, however, linked by a line that apparently represents a journey undertaken by a group of Quapaws from three villages via a French settlement to confront another group of Indians in an area of trees beyond which is another village. The toponyms may have been added later for each of the Indian villages; the French settlement is almost certainly Arkansas Post. The battle is probably one (or perhaps an amalgam) of several in which the Quapaws defeated the Chickasaws in the mid-1740s.²²⁰

218. For an earlier review of the maps of this region see Lewis, "Indian Maps" (note 2). There is a recent, detailed analysis of two nineteenth-century pictorial maps by a Northern Cheyenne scout: Glen Fredlund, Linea Sundstrom, and Rebecca Armstrong, "Crazy Mule's Maps of the Upper Missouri, 1877–1880," *Plains Anthropologist* 41, no. 155 (1996): 5–27.

219. Morris S. Arnold, "Eighteenth-Century Arkansas Illustrated," *Arkansas Historical Quarterly* 53 (1994): 119–36, esp. 119. For an expanded and revised analysis, see the same authors' "Eighteenth-Century Arkansas Illustrated: A Map within an Indian Painting?" in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis (Chicago: University of Chicago Press, 1998), chap. 8.

220. Arnold, "Arkansas Illustrated" (1994).

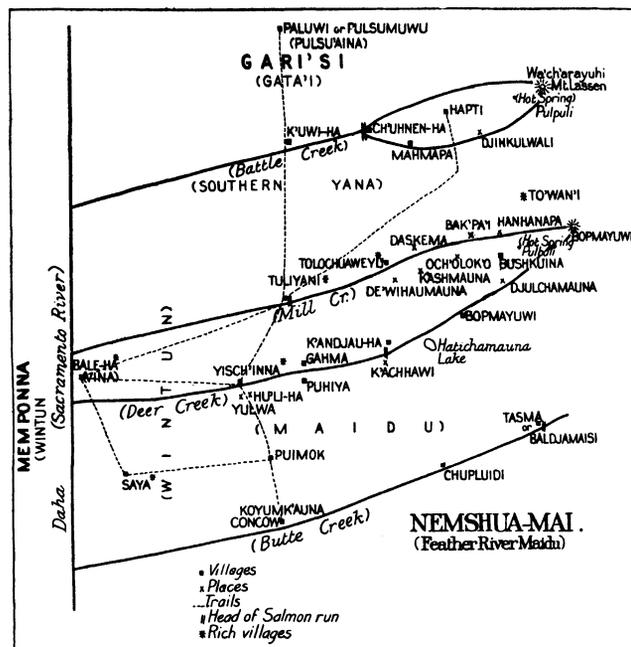


FIG. 4.52. MAP OF INDIAN TERRITORIES TO THE EAST OF THE UPPER SACRAMENTO RIVER, CALIFORNIA, BY ISHI. Discovered near Oroville in 1911, Ishi, the last of the Yahis, was taken to the Museum of Anthropology, San Francisco, where he died of tuberculosis five years later. During these years, he supplied information to Alfred L. Kroeber and T. T. Waterman, cultural anthropologists at the University of California, Berkeley. In 1914 Ishi was a member of an expedition to his people's former territory between Mill Creek and Deer Creek. The expedition "led by Ishi . . . covered a large part of Yahi ancestral territory, mapped it in detail, with village sites, trails, hidden brush shelters, and the smoke-lined caves . . . exactly located and named. On the maps were more than two hundred native place names" (Theodora Kroeber, *Ishi in Two Worlds: A Biography of the Last Wild Indian in North America* [Berkeley: University of California Press, 1961], 215–16). The precise nature of Ishi's mapping input is unknown. The field maps have apparently not survived. Either they or a smaller map by Ishi seem to have been the basis for the map shown here.

From A. L. Kroeber, *Handbook of the Indians of California*, Bureau of American Ethnology Bulletin 78 (Washington, D.C.: United States Government Printing Office, 1925), 344 (fig. 32).

In the nineteenth century, examples of cartographic elements in ledger art can be seen in two works by the Southern Cheyenne Howling Wolf the Nostalgic (Honanistto). In 1875 Howling Wolf and his father, Chief Minimic (Eagle Head), were among seventy-two members of an alliance of Kiowas, Comanches, Cheyennes, and Arapahos sent from Indian Territory for confinement at Fort Marion (in St. Augustine) on the Atlantic coast in northeast Florida. Their "crime" was refusing to be assigned to a reserve. The captives were offered the material and opportunity to produce artworks for sale. Some, mainly the younger men and those with a tradition of figurative art, took up the offer, including Howling Wolf, who contin-

ued to draw and paint after his return to Indian Territory in 1878.²²¹

In 1877 Howling Wolf was sent by sea from Fort Marion to Boston, Massachusetts, for treatment to his eyes. En route north along the Florida–Georgia–South Carolina coast he sent a one-cent prepaid postcard to his father at Fort Marion, addressed by an unknown person care of "Capt. Pratt, U.S.A., St. Augustine" (fig. 4.53).²²² Drawn in pencil (the numbers in ink relating to an explanatory key were added later), the message is a pictorial event map representing Howling Wolf's observations and experiences as far as a point off the South Carolina coast somewhere north of Savannah. The delineation of the coast is a bold and undifferentiated line with a pattern not readily relatable to the actual coastline between St. Augustine and a point north of Savannah. Three exaggerated estuaries are shown: probably the St. Johns River, perhaps the Altamaha, and almost certainly the Savannah.

A series of pen and watercolor sketches recording pre-preservation life made by Howling Wolf between 1878 and 1881 are considerably more elaborate than the informational picture map sent to his father. The first two, painted on facing pages in the ledger book, use landscape and directional elements to set the stage for historical events (figs. 4.54 and 4.55). The setting of figure 4.54 is a classic Plains landscape: a meandering river with floodplain on one side, undercut bluffs with trees on the other, and plateau plains beyond. Bison are shown moving single file from the plateau plains either to the shelter of the trees or to water by the river. Contemporary captions written by Ben Clark, the translator at Fort Reno, identified the first two paintings as "the first white man" at the Missouri River and "the first horses" acquired by the Cheyennes.²²³ Recent scholarship, however, has questioned the accuracy of Clark's captions, suggesting instead that the event recorded in the second sketch is the 1840 peace settlement among Plains Indians on the Arkansas River, identified by a flint arrowpoint pictograph. Szabo suggests that the first and second sketch may be parts of a single composition, with the first showing preparation for the gift exchange that accompanied the treaty.²²⁴

221. Joyce M. Szabo, *Howling Wolf and the History of Ledger Art* (Albuquerque: University of New Mexico Press, 1994), 67–68, 85–95. Several of Howling Wolf's drawings are reproduced in Berlo, *Plains Indian Drawings* (note 217), of which catalog numbers 50 and 55 are in part cartographic.

222. Reproduced with detailed caption in Karen Daniels Petersen, *Plains Indian Art from Fort Marion* (Norman: University of Oklahoma Press, 1971), pl. 43 (p. 224); biographical details on 221–22.

223. Karen Daniels Petersen, *Howling Wolf: A Cheyenne Warrior's Graphic Interpretation of His People* (Palo Alto, Calif.: American West, 1968), 34–40.

224. Szabo, *Howling Wolf*, 131–35 (note 221).



FIG. 4.53. PICTOGRAPHIC MESSAGE REPRESENTING A VOYAGE OF HOWLING WOLF. The message, dated July 1877, was drawn on a postcard sent from the Cheyenne Hontanisto (Howling Wolf the Nostalgic), at sea off the coast of South Carolina, to his father, Chief Minimic (Eagle Head) at Fort Marion, St. Augustine, Florida. The voyage was along the coast of northeastern Florida, Georgia, and southeastern South Carolina. The inked numbers were added later. Several aspects of the drawing are important from the perspective of cartography. Howling Wolf's father, Minimic, would recognize himself by his totem: the eagle head (2). He would also know to mentally situate himself in Fort Marion because of three distinctive landscape features: a striped lighthouse, watchtower, and cleated flagpole, the last two on a rampart (1). The number and spread of dots and dashes around the sin-

gle building representing each of the five urban settlements (3s and 4) probably indicated Howling Wolf's perception of the towns' importance, extent, or population. Finally, on a coastline extending for approximately 250 kilometers, disregard for linear scale is revealed by the representation in some detail of Howling Wolf's transshipment on the quay at Savannah (4), involving a walk (dashed line) from a smaller to a larger steamer (5). The howling wolf totem over the latter would leave Minimic in no doubt about who was on board, and the steamer's orientation would confirm that his son was still sailing away from Fort Marion.

Size of the original: 7.7 × 13.3 cm. Photograph courtesy of the Massachusetts Historical Society, Boston (Francis Parkman Papers).

A picture map made between 1890 and 1913 by Amos Bad Heart Bull, an Oglala Sioux, retrospectively depicts the location of several groups of Plains Indians assembled in 1876 for the Black Hills Peace Talks (fig. 4.56). Representatives of six nations are assembled in eight camps on a broad bench separating the foot of the Pine Ridge escarpment from the shallow but steep-sided inner valley of the White River. Other topographic details include tributary creeks of the main river and several insular buttes. Vegetation is represented by symbols: a coniferous tree symbol (pine) on Pine Ridge and the flanks of Crow Butte; a deciduous tree symbol (cottonwood) in the inner valleys of the White River and its creeks. Although the original, which was mostly in black ink with touches of six colors, is recorded only in a black-and-white photo-

graph,²²⁵ it is fairly certain that the conifers were depicted in one color (perhaps dark green), the cottonwoods in a lighter color (perhaps light green), and the benchlands in a third color. It is a portrayal of what ecologists later recognized as the three classic ecosystems of the Great Plains, each closely associated with a distinctive site. To

225. Amos Bad Heart Bull's drawings were made in a ledger between 1891 and his death in 1913. The ledger was inherited by his sister, Dollie Pretty Cloud, and buried with her on her death in 1941. The ledger was studied by Helen Blish, University of Nebraska, between 1927 and 1940 and was photographed in black and white in 1927. Blish compiled information about the colors and techniques used in the drawings; see Amos Bad Heart Bull, *A Pictographic History of the Oglala Sioux*, text by Helen H. Blish (Lincoln: University of Nebraska Press, 1967), 513–27 (appendix).



FIG. 4.54. SKETCH FROM THE FIRST PAGE OF HOWLING WOLF'S LEDGER, CA. 1880. Although said by a contemporary non-Indian to represent the first meeting of the French with the Cheyennes, which took place on the upper Missouri River about 1743, it may instead represent, with figure 4.55, a Plains Indian peace conference in 1840. Whereas

most of the sketch is in profile or oblique perspective, the river and tracks—bison, dog, and human—appear to be in plan. Ink and watercolor on paper.

Size of the original: 19 × 26 cm. Photograph courtesy of the Joslyn Art Museum, Omaha (JAM.1991.19, gift of Alexander M. Maish in memory of Anna Bourke Richardson).

Bad Heart Bull these were part of the topographical background to an important event in his nation's history, placing it in the context of a landscape that still existed.

The expression of cosmographical beliefs is another part of the pictorial tradition of Plains Indians. Because such beliefs are now neither completely known nor understood, their expression in maps may remain unrecognized. A case of cosmographic content recently revealed can be seen in another work by Bad Heart Bull, which is primarily a depiction of place rather than event. Drawn sometime between 1891 and 1913, it is centered on the Black Hills, South Dakota (fig. 4.57). The drainage pattern of the area is represented with great accuracy, together with meridians 103° and 104° west. These are derived from Euro-American constructions and in complete contrast to the dense and pictographic representation of the Black Hills at the center. Blish described this central component as a "typically imaginative, topographical re-

presentation" and pointed to the gross error whereby uniquely shaped Devils Tower (called *Maṭo tiṭi pāha* [Bear Lodge Butte] by the Lakotas), in reality sixty kilometers northwest of the Black Hills and to the north of the upper Belle Fourche River (North Cheyenne), is represented well within the confines of the Black Hills and just to the south of the middle section of the river.²²⁶ A recent interpretation, however, has revealed that it was not an error but an expression of the cosmographical principle of mirroring. The Lakotas

felt a vivid relationship between the macrocosm, the star world, and their microcosmic world on the plains [of South Dakota]. There was a constant mirroring of what is above by what is below. Indeed, the very shape of the earth was perceived as resembling the constellations. For example, the red clay valley which encircles

226. Bad Heart Bull, *Pictographic History*, 289–90.



FIG. 4.55. SKETCH FROM THE SECOND PAGE OF HOWLING WOLF'S LEDGER, CA. 1880. See figure 4.54. Size of the original: 19 × 26 cm. Photograph courtesy of the

Joslyn Art Museum, Omaha (JAM.1991.19, gift of Alexander M. Maish in memory of Anna Bourke Richardson).

the Black Hills looks like (and through Oral Tradition is correlated with) a Lakota constellation which consists of a large circle of stars.²²⁷

The great circle of stars formed by Sirius, Procyon, Castor, β Aurigae, Capella, Pleiades, and Rigel is called the Race Track or Sacred Hoop. Its mirror on earth is the red clay valley encircling the entire Black Hills, which forms a sacred enclosure. In Lakota theology all of life occurs within an unending circle of time, space, matter, and spirit. Hence the Black Hills are viewed as the microcosmic hoop out of which new life is born each year. Specific topographic features within the hills are equated with celestial features and the traditions associated therewith. In addition, one landmark outside the Black Hills also has such an association—Devils Tower. A constellation consisting of eight of the stars in Gemini, just within the Race Track, is associated with the tradition whereby Fallen Star saved a brother and sister from being attacked by bears, and this tradition on earth is associ-

ated with Devils Tower.²²⁸ In placing that feature within the valley, Amos Bad Heart Bull was acknowledging that the spiritual world was superior to the intellectual or physical world. In short, theology overrode topology. For Euro-Americans, confusion between the natural and spiritual-mythological worlds could lead to serious misunderstandings of Native American representations. A more enlightened interpretation now recognizes that terrestrial, celestial, and mythological worlds can coexist.²²⁹

A late example of a map depicting historical events was produced by Sitting Rabbit, a Mandan, in 1906 as part of a commission from the State Historical Society of North Dakota (fig. 4.58). The genesis of this map of the Missouri River in North Dakota, and the fact that its eleven segments correspond to a sectional chart published by the Missouri River Commission between 1892 and

227. Goodman, *Lakota Star Knowledge*, 1 (note 18).

228. Goodman, *Lakota Star Knowledge*, 4 and 7.

229. For example, in some southwestern sandpaintings.

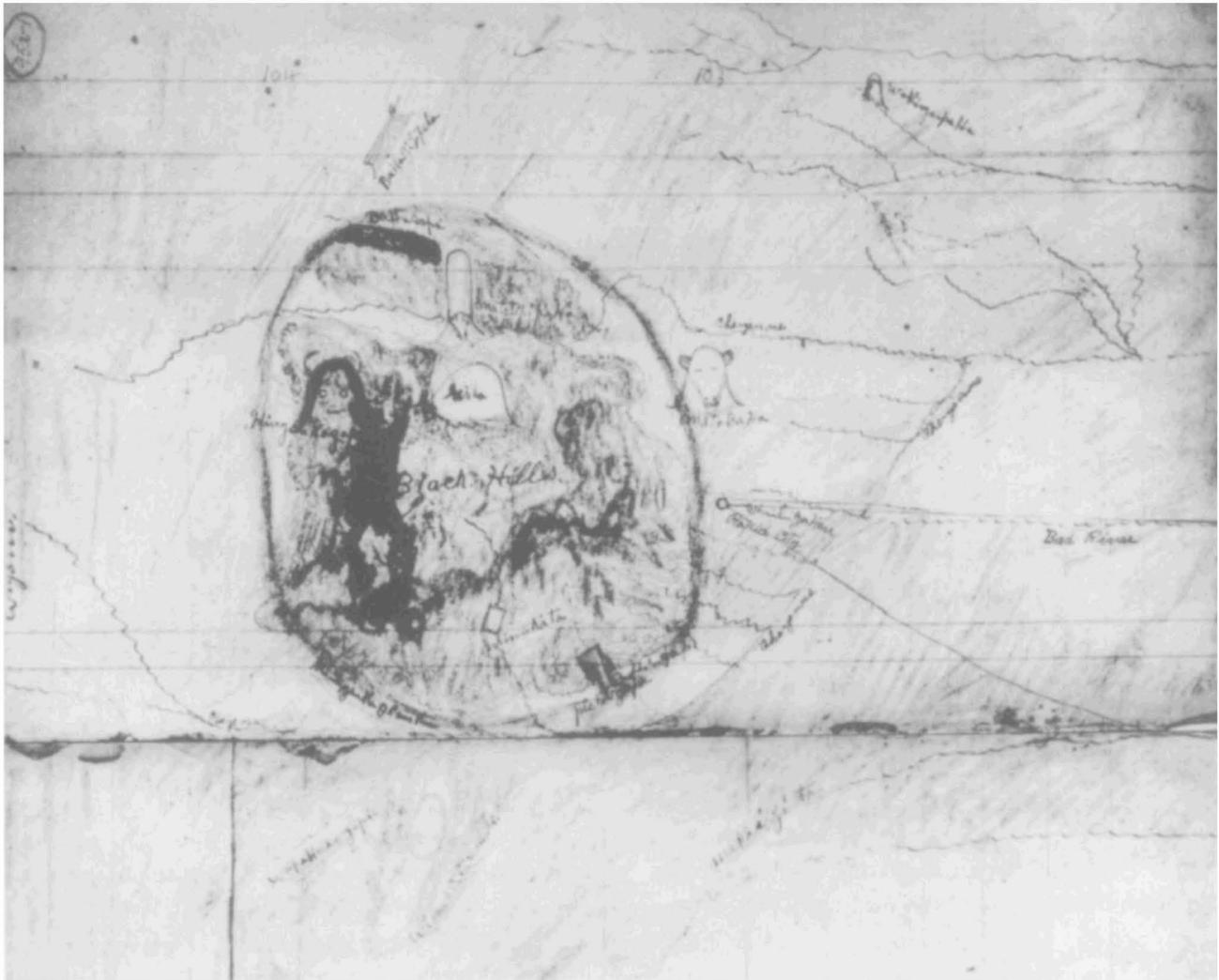


FIG. 4.57. AMOS BAD HEART BULL'S PARTLY PICTOGRAPHIC MAP OF THE BLACK HILLS, SOUTH DAKOTA, AND THE SURROUNDING PLAINS. The map is black ink and five colors of crayon in a large ledger, which was interred in 1947 with Bad Heart Bull's sister, Dollie Pretty Cloud, but it had been photographed in 1927. Oglala Sioux and made between 1891 and 1913, the map is a highly stylized, undoubtedly traditional, cosmographical representation of the Black Hills, placed in the spatial context of a surrounding drainage

1895, suggests a strong Euro-American influence. Nonetheless, it represents in considerable detail conditions and events at several locations.²³⁰

CELESTIAL MAPS

Although only one example exists in a museum collection, Plains Indians also depicted celestial features on hides. These share their medium and a cultural and ritual purpose with early pictorial works. The extant example, made by the Skiri band of Pawnees, is part of a collection of ritual objects obtained from them at Pawnee, Okla-

network copied, modified, or recollected from a survey map with American names, meridians, and survey lines.

Size of entire original: ca. 35.6 × 30.5 cm. Reproduced from Amos Bad Heart Bull, *A Pictographic History of the Oglala Sioux*, text by Helen H. Blish (Lincoln: University of Nebraska Press, 1967), 289 (no. 198), by permission of the University of Nebraska Press. Copyright © 1967, renewed 1995, by the University of Nebraska Press.

homa, in 1906, soon after they had moved there from the Platte Valley, and is known as the Big Black Meteoric Star

230. Thomas D. Thiessen, W. Raymond Wood, and A. Wesley Jones, "The Sitting Rabbit 1907 Map of the Missouri River in North Dakota," *Plains Anthropologist* 24, pt. 1 (1979): 145–67. In part, the purpose of that paper was to evaluate the utility of Sitting Rabbit's map as a source of archaeological information. For an evaluation of Indian maps as sources of archaeological information in another region, see Gregory A. Waselkov, "Indian Maps of the Colonial Southeast: Archaeological Implications and Prospects," in *Cartographic Encounters: Perspectives on Native American Mapmaking and Map Use*, ed. G. Malcolm Lewis (Chicago: University of Chicago Press, 1998), chap. 9.

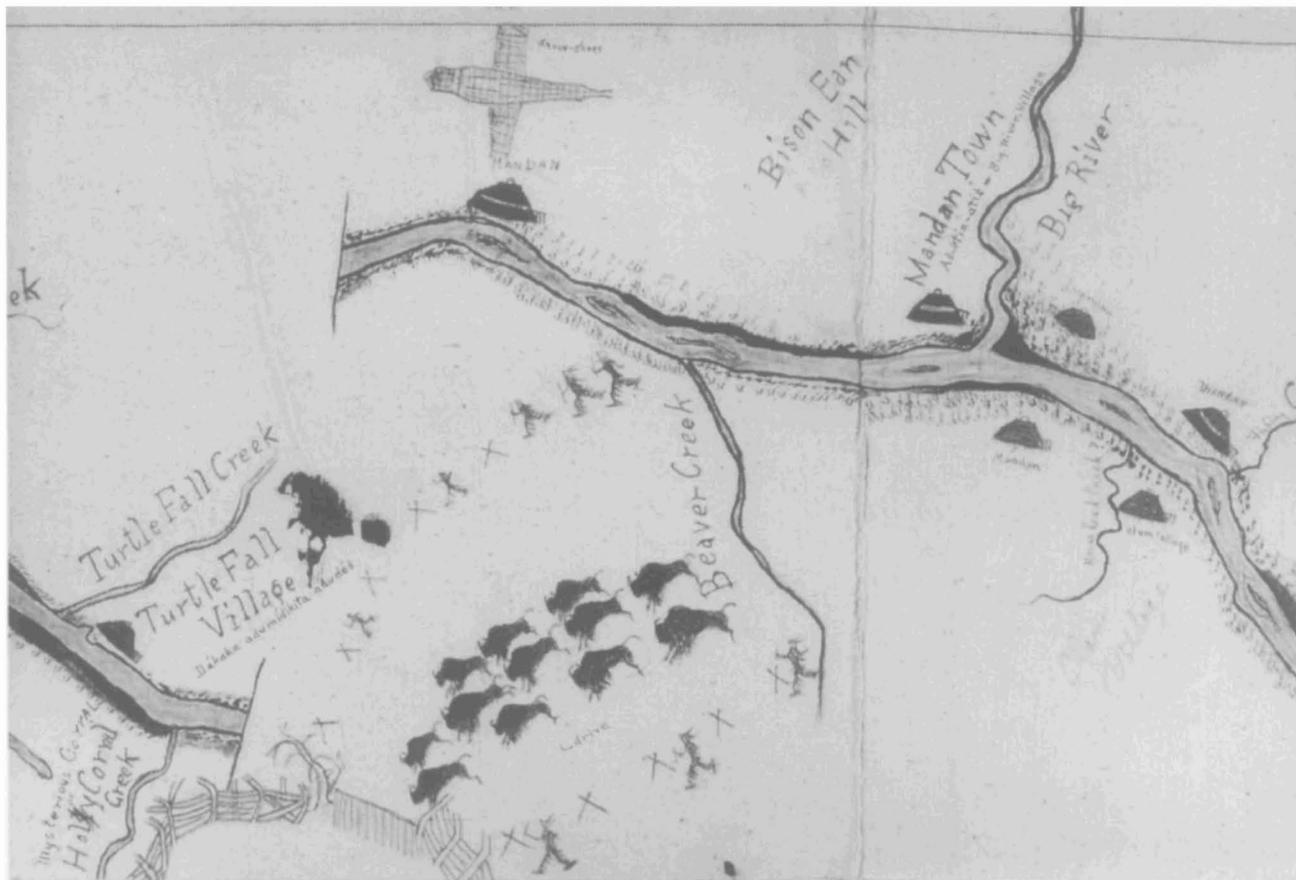


FIG. 4.58. DETAIL FROM A MAP PAINTED BY SITTING RABBIT OF THE MISSOURI RIVER IN NORTH DAKOTA, 1906–7. Mandan, untitled painting by Sitting Rabbit (I Ki Ha Wa He, also known as Little Owl) of the Missouri River from the Standing Rock Reservation to the mouth of the Yellowstone River. The Missouri River is represented in eleven discontinuous sections on one canvas. The planimetry was derived from the sheets of a sectional chart published for the War Department by the Missouri River Commission in 1892–95, but the other content is original. Content on this detail includes bison moving into a funnel of fencing and men and about to fall over a jump into a stockaded pound below near what is now Little Beaver Creek on the eastern side of the Missouri River oppo-

site Standing Rock Indian Reservation; it also shows numerous former village sites, mainly Mandan, each represented by the profile of one or more earth lodges, some identified by their totems (for example, the crossed pair of snowshoes). Other parts of the map, not shown here, depict a trading post, symbolized by the end elevation of a log cabin; pictographs for several natural features, for example, a knife for Knife River and a bison head for Buffalo Head Hill; and grid patterns to indicate the plans of Euro-American settlements and Indian agencies.

Size of the entire original: 45.5 × 707 cm. Size of this detail: ca. 45.5 × 80 cm. Photograph courtesy of the State Historical Society of North Dakota, Bismarck (no. 679).

Bundle. The bundle was said to have existed before the band knew of Euro-Americans or even Europeans.²³¹ When acquired by the Field Museum of Natural History, Chicago, it contained what was identified as a star chart painted on skin (plate 7). It is not known when the chart came to be associated with the bundle, but its role is certainly long established and complex.

Among the Pawnees, sacred bundles were kept and used by priests who mediated between the people and the deities—stars and other celestial phenomena that controlled the weather and plant growth. Each bundle was cared for between ceremonies by the wife of its keeper, and there were strict rules about how it was to be kept.

There were several types of these bundles, but, regardless of the type, they all had in common an origin that traced back to an earlier supernatural experience or encounter. . . . Contents common to all bundles

231. James R. Murie, *Ceremonies of the Pawnee*, 2 pts., ed. Douglas R. Parks, Smithsonian Contributions to Anthropology, no. 27 (Washington, D.C.: Smithsonian Institution Press, 1981), pt. 1, 96. The earliest direct contacts between Europeans and the Pawnee were by the French in 1714 (Etienne de Véniard, sieur de Bourgmont) and 1719 (Claude Du Tisne) and by the Spanish in 1720 (Pedro de Villasur). The Pawnees, however, probably knew of French activities in the middle Mississippi Valley as early as 1673, when Louis Jolliet and Jacques Marquette became the first Europeans to see the confluence of the Missouri River with the Mississippi.

were a pipe, tobacco wrapped in the pericardium of a buffalo, a braid of sweetgrass, paint, one or more ears of corn (referred to as “Mother Corn”), the skins of various birds and animals, and sometimes a scalp. Each bundle had additional contents that varied with the symbolism of its history and the particular needs of its rituals.²³²

Ralph Linton of the Field Museum described the star chart associated with the Big Black Meteoric Star Bundle:

a soft tanned skin, but the tanning has not been done very well, since patches of both the epidermis and the inner membrane still adhere. The skin appears to be antelope or deer, not buffalo. The chart is painted on what was the hair side. The outline of the chart and the stars are painted black. A narrow strip at one end (top) of the chart is painted red. At the opposite end there is a similar strip which seems to have been painted yellow or light brown. In the left hand sector is an oval figure, 1 inch (2.54 cm) long and $\frac{3}{4}$ inch (2 cm) wide, its long axis parallel to that of the chart, which seems to have been drawn with a heated bone point since the surface is depressed somewhat. Further, the chart seems to have been heavily coated with red paint, most of which has now worn off. Around its edges there are many small slits through which a drawing string was originally passed. Only a fragment of the string remains. The discolorations on both sides of the chart show that the edges were drawn as for a bag.²³³

Although known as a star chart, the painted hide was meant not primarily to show the locations of stars and constellations, but to serve as a mnemonic for mythology and cosmology, both closely tied to astronomical phenomena.²³⁴

In order to comprehend indigenous maps, it is necessary to understand indigenous architecture, material culture, and ritual. The Pawnee star chart is not merely a map of the celestial sky. Its direct uses are as a beacon for heavenly forces, as an earthly guide, as a symbol of cosmological unity, and as a flag of identity during the Thunder and/or Great Washing ceremonies. However, it is symbolically associated and interchangeable with the artifacts from the Big Black Meteoric Star bundle and the Pawnee earth lodge. Therefore, the Pawnee star chart must be taken as a package with those items.²³⁵

A recently published discussion of celestial maps among the Lakota has shed further light on the principles and practices behind cosmographical mapmaking. Research for a book on Lakota stellar theology uncovered the existence of paired earth and sky maps on tanned hides, which, in the words of the elder Stanley Red Bird, “were really the same, because what’s in the stars is on the earth,

and what’s on the earth is in the stars.” On another hide, star and earth maps are said to be combined, with earth sites represented by a triangle pointing up and celestial sites by an inverted triangle. “These shapes are not to be understood as flat triangles, but as cones, as vortices of light.” The unnamed keeper explained that “without proper instruction it wouldn’t even be recognized as a star map. Asked to explain why, he replied that this was partly because the stars as they are drawn on the robe look like a pie wedge or long triangle. He added that the shape on earth they most resemble is the cottonwood leaf twisted into the form of a tipi.”²³⁶ This interpretation underscores the importance of individuals who preserved both artifacts and interpretations. Like the Ojibwas’, Plains Indians’ traditions were often preserved by specially appointed custodians, and there is occasional evidence that this custom continues. The late date at which knowledge of the paired maps came to light is evidence of the secrecy with which artifacts like these are preserved. The practice, long concealed from Euro-Americans, of correlating patterns of stars seen in the sky with spatial patterns of earth features that were too extensive to have been seen in perspective must have been constructed in the course of accumulated experience over many generations.

For both the Lakotas and the Skiri Pawnees, star charts represented a celestial macrocosm that was mirrored in part by their microcosm: the architectural structures and lodge distribution patterns of their village world. The function of Plains Indians’ sky charts was primarily, if not exclusively, to record cosmographic principles for succeeding generations.

MAPS MADE FOR EURO-AMERICANS: THE SEVENTEENTH CENTURY

As in other regions, there is a body of maps made by Plains Indians to communicate with Euro-Americans. Those that are extant survive only as transcripts made by the authorities they were drawn for. The earliest example (indeed, the earliest extant for all of North America) was drawn in April 1602 by a captive Plains Indian called Miguel, who was being interrogated in Mexico City by Don Francisco de Valverde. Valverde was conducting an inquiry into the Juan de Oñate expedition, which had captured Miguel the previous autumn. In the course of

232. Murie, *Ceremonies of the Pawnee*, pt. 1, 13.

233. Murie, *Ceremonies of the Pawnee*, pt. 1, 180 n. 46.

234. Von Del Chamberlain, *When Stars Came down to Earth: Cosmology of the Skidi Pawnee Indians of North America* (Los Altos, Calif.: Ballena Press, 1982), 184–205; Parks, “Interpreting Pawnee Star Lore,” 63–64 (note 14); and Chamberlain, “Chief and His Council,” 231–32 (note 12).

235. Gartner, “Pawnee Cartography,” 40 (note 15).

236. Goodman, *Lakoŋa Star Knowledge*, 16 and 18 (note 18).

the interrogation, Miguel drew a map, and a manuscript transcript of it was made on 11 May 1602 (fig. 4.59).²³⁷ The orthography of Indian names and the referents of several named rivers have never been satisfactorily resolved. The main network of rivers and trails seems to link places, peoples, and features as far apart as the upper Pecos Valley, either an east bank tributary of the Arkansas River in what is now northeast Oklahoma or the Trinity River south of Dallas, and another Texas river, and there is also an inset map (center left) of a reported placer gold mining region somewhere in what must have been Mexico. Excluding this Mexican detail, Miguel's map probably embraced more than 200,000 square kilometers. Since we do not have the original that Miguel drew, we can only speculate on what it looked like. Transcribing no doubt screened out indigenous iconography and unwanted or ambiguous information from Miguel's original when it was transcribed a few weeks later by Hernando Esteban, the royal notary.

The transcript of the interview with Miguel reported that when asked to mark "the pueblos of his land," he drew circles, "some larger than others," connecting them with a network of "caminos" (trails). Miguel later supplemented the map gesturally. He noted that the pueblos contained "many people, emphasizing their number by gestures." He also showed how far it was between the various places in days of travel. He apparently indicated this not on the map but by "counting the days with kernels of corn."²³⁸ The map contains a key: one very large circle representing the population of the city of Mexico and three smaller but approximately equal ones representing the three settlements in what is now northwestern Mexico, via which Miguel's captors had brought him to their city. Assuming the contemporary transcript is a reasonable copy of Miguel's original, the message seems to be that none of the settlements in his land were as populous as Mexico City; they differed only slightly among themselves; and they were comparable to or slightly smaller than the three settlements in northwestern Mexico. Although Miguel may have had a precise knowledge of the population sizes of the pueblos of his lands, his experience of the three settlements in northwestern Mexico could only have been brief and his knowledge of them must have been impressionistic.

Another mapping event was described at the same inquiry. Asked why the Oñate expedition had turned back, Juan Rodríguez stated that "it was because of the information they had received of so many people in the settlement as well as farther on and because there were reports that many people were assembling to attack us." The information had been given by unspecified Plains Indians who "told of the large settlements toward the north [and] marked them by placing seventeen kernels of corn on the settlement where they were, and seven hundred on each

of those in the north, thereby giving us to understand that they were that much larger than the settlement we had discovered. They also traced many rivers on a piece of paper that the *maese de campo* gave them, saying that those settlements were located on them." The small settlement where the map was made was almost certainly depicted on the *Rasguño de las Provincias del Nuevo Mexico*, a 1602 manuscript map by Enrico Martínez that was "apparently the earliest map now still in existence portraying actual, on-the-spot observation of any part of the American Transmississippi West."²³⁹ The European map represents the small settlement, identified as "pueblo de nuevo descubrim^o," by means of twenty-three small triangles, not seventeen as the reported number of kernels might have led one to expect. Most, but not all, of the other settlements on the map are represented by European-style symbols.²⁴⁰

Another event is associated with French exploration into the interior. In 1688 or 1689, Louis Armand de Lom d'Arce, baron de Lahontan, ascended the lower Minnesota River. On his return trip he was visited by a large party of Gnacsitares, accompanied by four Mozeemlek slaves, from the northeastern edge of the Great Plains. The slaves gave him "a Description of their Country, which the *Gnacsitares* represented by way of a Map upon a Deer's Skin."²⁴¹ The skin did not survive, but the map

237. Hammond and Rey, *Don Juan de Oñate*, 2:871–77 (note 188). Surprisingly, the map was not reproduced in this definitive edition, yet it had been available in a modern transcript from since the early twentieth century: Woodbury Lowery, *The Lowery Collection: A Descriptive List of Maps of the Spanish Possessions within the Present Limits of the United States, 1502–1820*, ed. Philip Lee Phillips (Washington, D.C.: Government Printing Office, 1912), 104–5. The original was not reproduced until 1982: William W. Newcomb and T. N. Campbell, "Southern Plains Ethnohistory: A Re-examination of the Escanjaques, Ahijados, and Cuitoas," in *Pathways to Plains Prehistory: Anthropological Perspectives of Plains Natives and Their Pasts*, ed. Don G. Wyckoff and Jack L. Hofman (Duncan, Okla.: Cross Timbers Press, 1982), 29–43, esp. fig. 1. See also Lewis, "Indian Maps" (note 2).

238. Hammond and Rey, *Don Juan de Oñate*, 2:872–73, 874.

239. Hammond and Rey, *Don Juan de Oñate*, 2:867–68.

240. Carl I. Wheat, *Mapping the Transmississippi West, 1540–1861*, 5 vols. (San Francisco: Institute of Historical Cartography, 1957–63), vol. 1, map 34 and p. 29. The map is preserved in the Archivo General de Indias, Seville. Juan Rodríguez gave unspecified information to Enrico Martínez, the king of Spain's Mexican cosmographer, that provided at least some of the information for this map of the central or southern Great Plains (or both). Rivers on the map extend beyond the village where the expedition turned back, possibly on the authority of the map the Indians traced on paper.

241. Lahontan, *New Voyages*, 1:124 (note 93); French edition: Louis Armand de Lom d'Arce, baron de Lahontan, *Nouveaux Voyages de Mr le baron de Lahontan dans l'Amerique Septentrionale*, 2 vols. (The Hague: Chez les Frères [sic] l'Honoré, 1703). According to the map, the Gnacsitares and Mozeemleks occupied the upper valleys of the Minnesota and Big Sioux Rivers, respectively. Neither group has been linked conclusively with Indians known in later postcontact times, but the eastern escarpment of the Coteau des Prairies may already have be-

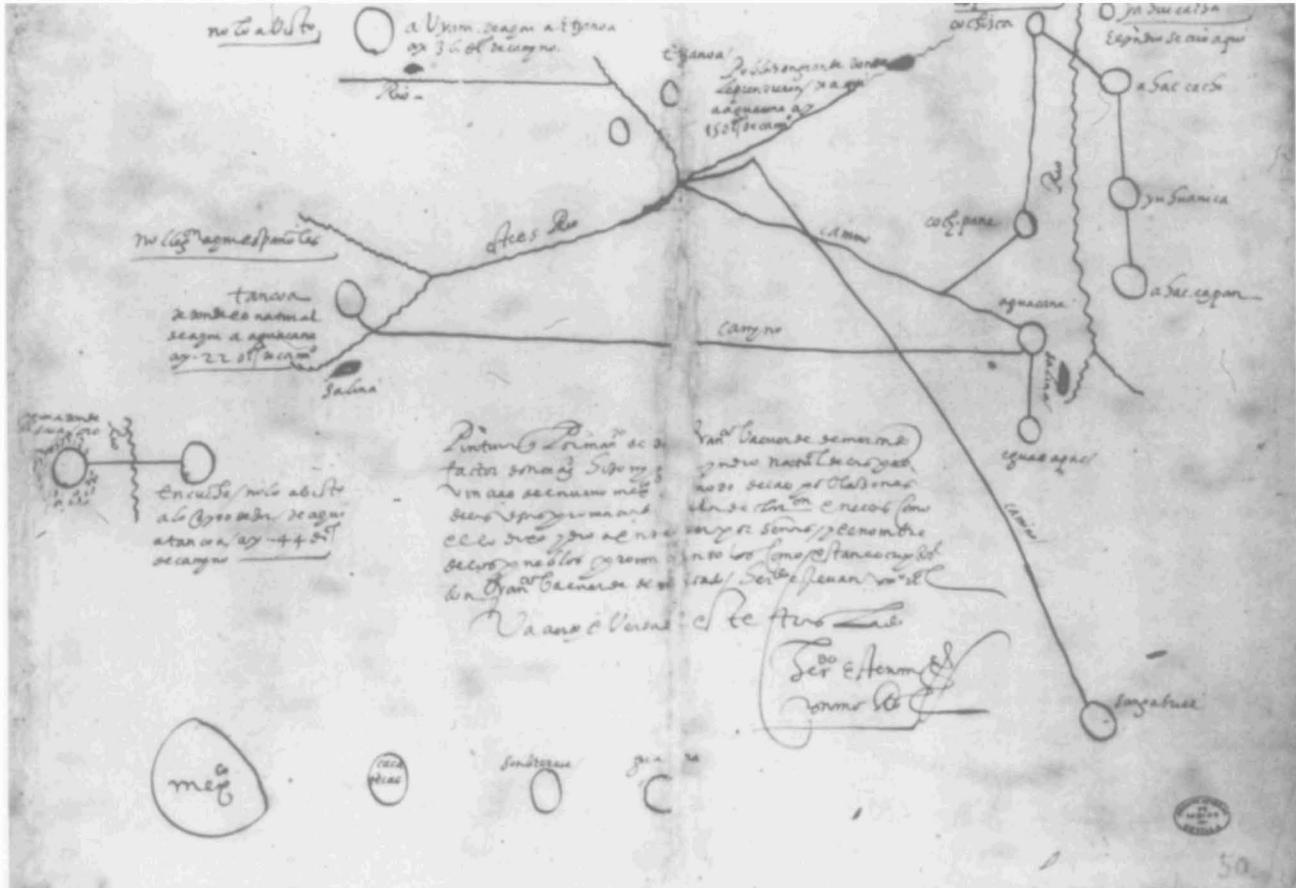


FIG. 4.59. CONTEMPORARY MANUSCRIPT COPY OF INDIAN MAP MADE IN 1602 SHORTLY AFTER FIRST CONTACT WITH EUROPEANS. “Pintura q Por man^{do} de don Fran^{co} Velverde mercado factor de su mag^d hizo myguel yndio de las pro vincias del nuevo mex^{co}” (Sketch which, by order of Don Francisco Valverde de Mercado, factor of His Majesty, was made by Miguel, an Indian, native of the provinces of New Mexico, of the relative position of the towns of the said provinces. Don Francisco Valverde de Mercado/Hernando Esteban—This transcript is ([certified] correct and

truthful [by] Hernando Esteban.) The original map was made by Miguel, probably an Indian from the southern Plains, on 22 April 1602, and this transcript was made on 11 May 1602. Excluding possible maps in rock art and incorporations on a few maps made by Europeans, this is the oldest extant transcript of a North American Indian map. Size of the original: 31 × 43 cm. Photograph courtesy of the Ministerio de Cultura, Archivo General de Indias, Seville (Mapas y Planos, México, 50).

content was incorporated in the printed map accompanying both the French and English editions of Lahontan’s accounts of his travels (fig. 4.60).²⁴² There seems little doubt that the deerskin map represented the lakes through which the Minnesota River flows in its upper reaches, the steep-sided Coteau des Prairies to the west of them, and the headwater region of the Big Sioux River beyond. The French and English editions of the printed map refer respectively to “peaux de Cerfs” and “Stag skins,” probably of a white-tailed deer. The use of the plural (“peaux” and “skins”) on the maps is in contrast to Lahontan’s text, where the singular is used. The use of one skin seems most likely—an original made on two or more deerskins would have been very large.

A range of boldly drawn hills is prominent on the left side of the printed map. Lahontan did not reach this area

but reported that the watershed was described as “Mountains . . . six Leagues broad, and so high that one must cast [in the hunting context of to spread out and search for a lost scent] an infinity of Windings and Turnings before he can cross ’em. Bears and wild Beasts are their only Inhabitants.”²⁴³ This alpine image and the bold hill symbols on the engraved map, identified as “High Mountains” on the English version, may in part have been consequences of translating, transcribing, and engraving.

come a critical boundary between two Sioux: perhaps the Santees and Yanktonais.

242. In the French edition: “Carte que les Gnacsitaires ont Dessine sur des peaux de Cerfs” (this title is on the left half of the map and is separated from the second title by a double dotted line) “Carte de la Riviere Longue et de quelques autres”; Lahontan, *Nouveaux Voyages*, vol. 1.

243. Lahontan, *New Voyages*, 1:124–25 (note 93).

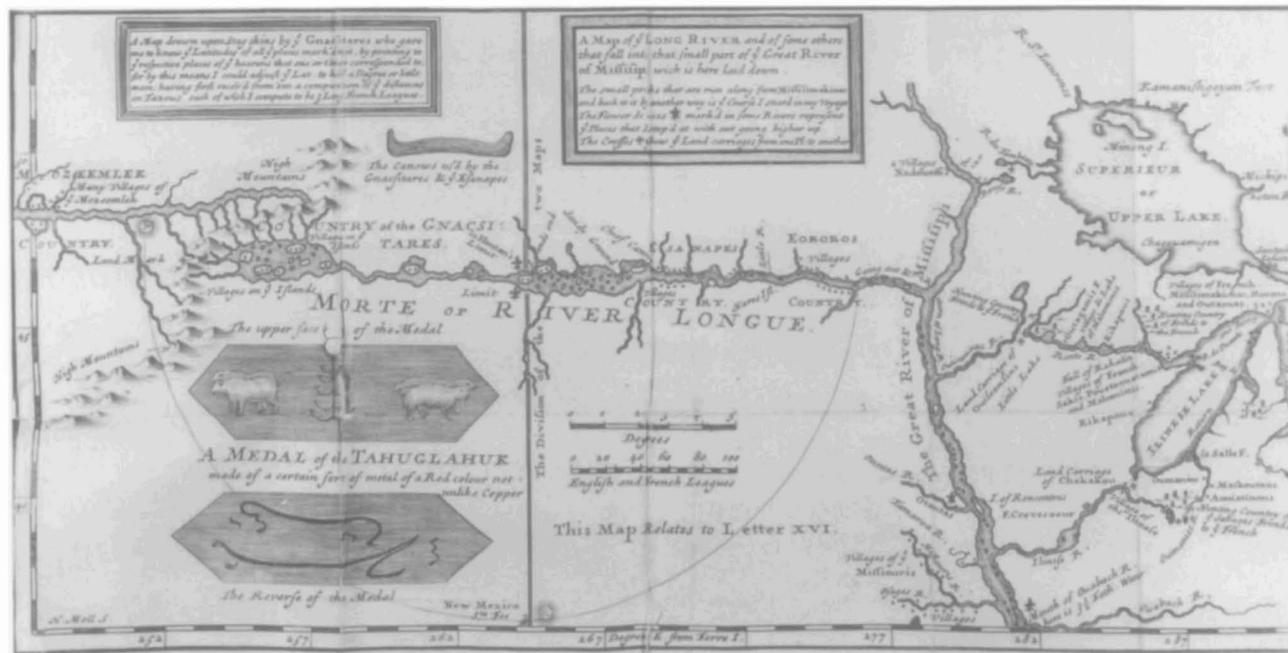


FIG. 4.60. ENGRAVED COPY OF A MAP OF THE COTEAU DES PRAIRIES BASED ON AN INDIAN MAP ON SKIN. The title for the map on the left third of the sheet ("A Map drawn upon Stag skins by y^e Gnacsitaires") is separated from the one on the right ("A Map of y^e Long River") by a thick line labeled "The Division of the two Maps." The line has two small fleurs-de-lis indicating the upstream limit of Lahontan's voyage. There has never been agreement about the identity of

the Gnacsitaires, but because Lahontan met them in the upper-middle Minnesota River, it is assumed that they were Siouan people from the eastern Plains.

Size of the original: 16.5 × 34 cm. From Louis Armand de Lom d'Arce, baron de Lahontan, *New Voyages to North America*, 2 vols. (London: H. Bonwicke and others, 1703). Photograph courtesy of the State Historical Society of Wisconsin, Madison (WHi [X3] 50545).

Nevertheless, there is little doubt that the hills were a dominant element on the original deerskin. The range was probably the 230-meter-high eastern escarpment of the Coteau des Prairies. This feature was given emphasis because it contained the only prominent hills in a fairly flat region, but also because the hills marked a cultural divide. Approached from the east they marked the beginning of a new resource region in which bison were prolific.

The map depicts a large lake at the edge of the "High Mountains" fed by a series of short streams draining into it and situated near the source of the "Morte or River Longue" (Minnesota River). "Villages on ye Islands" are represented by a large number of dots. In its upper reaches, the Minnesota River does indeed open out into a series of narrow, relatively long lakes. To represent them all would have been impossible. To exclude them would have been to omit an important part of the cultural heartland of the Gnacsitaires. Amalgamation of several narrow lakes into one wide one, placing a few stylized islands thereon, and locating dots on the larger of these created a visual impression of power.

recorded both for internal briefing and for geographical communication with Euro-Americans. One late nineteenth-century account describes a cartographic briefing with ephemeral maps among the Comanches of western Texas, who, beginning in the eighteenth century, frequently mounted raids into northern Mexico for slaves, horses, and women,²⁴⁴ sometimes traveling as far as four thousand kilometers round-trip. Such raids probably reached their peak between approximately 1830 and 1845, before Texas became a state.²⁴⁵ Richard Dodge was told how the older men would

assemble the boys a day or two before the start for instruction. All being seated in a circle, a bundle of sticks is produced, marked with notches to represent the [journey] days. Commencing with No. 1, the stick with one notch, each is taken in succession. A rude map is drawn on the ground with finger or piece of wood illustrating the journey of the day represented by the notched stick. The larger rivers and streams are indicated, the hills, valleys, ravines, hidden water holes in dry countries, every natural object, peculiar or striking. When this was understood, the stick representing

NINETEENTH-CENTURY EPHEMERAL MAPS

Nineteenth-century ephemeral maps from this region are

244. Waldman, *Atlas of the North American Indian*, 151 (note 165).

245. William W. Newcomb, *The Indians of Texas, from Prehistoric to Modern Times* (Austin: University of Texas Press, 1961), 349–50.

the next day's march [presumably ride] was illustrated in the same way, and so on to the end. He [Dodge's informant, Pedro Espinosa] further stated that he had known one party of young men and boys, the oldest not over nineteen, and none of whom had ever been into Mexico, to start from the main camp on Brady's Creek in Texas, and make a raid as far into Mexico as the City of Monterey, solely by memory of information fixed in their minds and represented by such sticks.²⁴⁶

Monterrey is more than six hundred kilometers from Brady Creek, through difficult terrain; yet by implication at least, the raid and therefore the cartographic briefing were successful.

Maps on the ground made for Euro-Americans were sometimes misunderstood. In 1820 near the western edge of Mesa de Maya in what is now southeastern Colorado, a Kiowa-Apache drew a map in the sand for geologist Edwin James that was "a minute account of the situation of the spring, and of the surrounding country, stating that the salt existed in masses at the bottom of a basin-like cavity, which contained about four and a half feet of reddish water. Thus far we had not found a single feature of the country to correspond, in the slightest degree, to his descriptions, and as we had been careful to follow the general direction of the course pointed out to us, it was probably his intention to deceive."²⁴⁷ It may well be that, rather than intending to deceive, the Indian was representing the great salines, four to five hundred kilometers down the Cimarron River to the east and on the Salt Fork of the Arkansas River, not a nearby feature as James expected.

Sometimes Plains Indians made maps on the wooden floors of buildings erected by settlers. In 1858, at Fort Ellice in what is now southwest Manitoba, the explorer James A. Dickinson wanted to obtain the Indian names for the tributaries he had observed in passing down the Qu'Appelle River. An old Indian, probably Plains Cree or Assiniboine, drew a map on the floor with a piece of charred wood showing "every little creek so accurately that I easily recognised them."²⁴⁸

In 1833 the Wah paa Koo ta and other bands of Sioux disputed an article in the treaty made three years before at Fort Tecumseh. Acting on their account, Lawrence Taliaferro wrote to Elbert Herring enclosing a transcript "hastily tho imperfectly" taken from a map "Marked with Charcoal on the floor of the Agency Office" by a Wah paa Koo ta Sioux. The transcript contains no evidence of pictographs, and the original was evidently large. The map was presented as evidence disputing the surveying of a straight line delineating land they had supposedly agreed to cede in the treaties of 1825 and 1830 (fig. 4.61). William Clark, who had been appointed superintendent of Indian affairs at St. Louis after returning

from leading the Lewis and Clark expedition, forwarded the letter to Herring. He reported that in his opinion the map was "very inaccurate," revealing how even someone with considerable direct experience with Indians might fail to evaluate native maps on their own terms.²⁴⁹

NINETEENTH-CENTURY MAPS MADE ON PAPER

Other extant copies of maps on paper contain considerably more information, including natural, cultural, and political features and historical events, some of them similar to those found on the pictorial maps considered earlier. In the early nineteenth century, several maps by Plains Indians were solicited by Peter Fidler, a surveyor for the Hudson's Bay Company. The Blackfoot chief Ki oo cus (the Little Bear) drew a map of the Missouri and South Saskatchewan Rivers headwaters regions in 1802, of which a transcript made by Fidler exists (fig. 4.62). Fidler's transcript contains considerable information about vegetation and landscape features in inscriptions in Blackfoot and English. Examples of landscapes include "high rocks, little poplar" and "a round hill, woods below, none at top." Elsewhere the emphasis is on vegetation as a resource: "little poplar and berries," "berries," and "plenty of berries." Fidler's transcript also denoted the "woods edge" between the forests and grasslands (as distinct from the woods edge much farther north between the forests and the tundra). Ki oo cus is the only Indian known to have placed that particular biogeographic boundary on a map, though several fur traders did so, probably based on information received from Indians. Given the homeland of the Blackfeet, Ki oo cus would have been almost as familiar with the spruce and fir forests, aspen groves, and wheatgrass prairies of what is now southeast Alberta as with the dry-belt prairies of northern Montana where he made the map.

The map also represents cultural features. Single dashed lines represent routes across and along interfluvial plateau lands, along which are placed small circles repre-

246. Richard Irving Dodge, *The Plains of the Great West and Their Inhabitants* (New York: G. P. Putnam's Sons, 1877), 414.

247. Edwin James, *Account of an Expedition from Pittsburgh to the Rocky Mountains*, 2 vols. and atlas (Philadelphia: Carey and Lea, 1822–23), 2:80–81.

248. Henry Youle Hind, *North-west Territory: Reports of Progress* (Toronto: Lovell, 1859), 59.

249. Letter from Lawrence Taliaferro, Indian Agent at St. Peters, to William Clark, Superintendent of Indian Affairs, St. Louis, and to Elbert Herring, Commissioner of Indian Affairs, Washington, D.C., both dated 5 July 1833, and letter from Clark to Herring, dated 21 July 1833; "Letters Received from St. Peters Agency 1824–70," National Archives, Washington, D.C., Records of the Bureau of Indian Affairs, RG 75 (microfilm roll 757, M 234). The map accompanied Taliaferro's letter to Herring but was sent via Clark, who supplemented it. Wah paa Koo ta is probably the Wahpekute band of Dakota proper (Eastern Sioux).

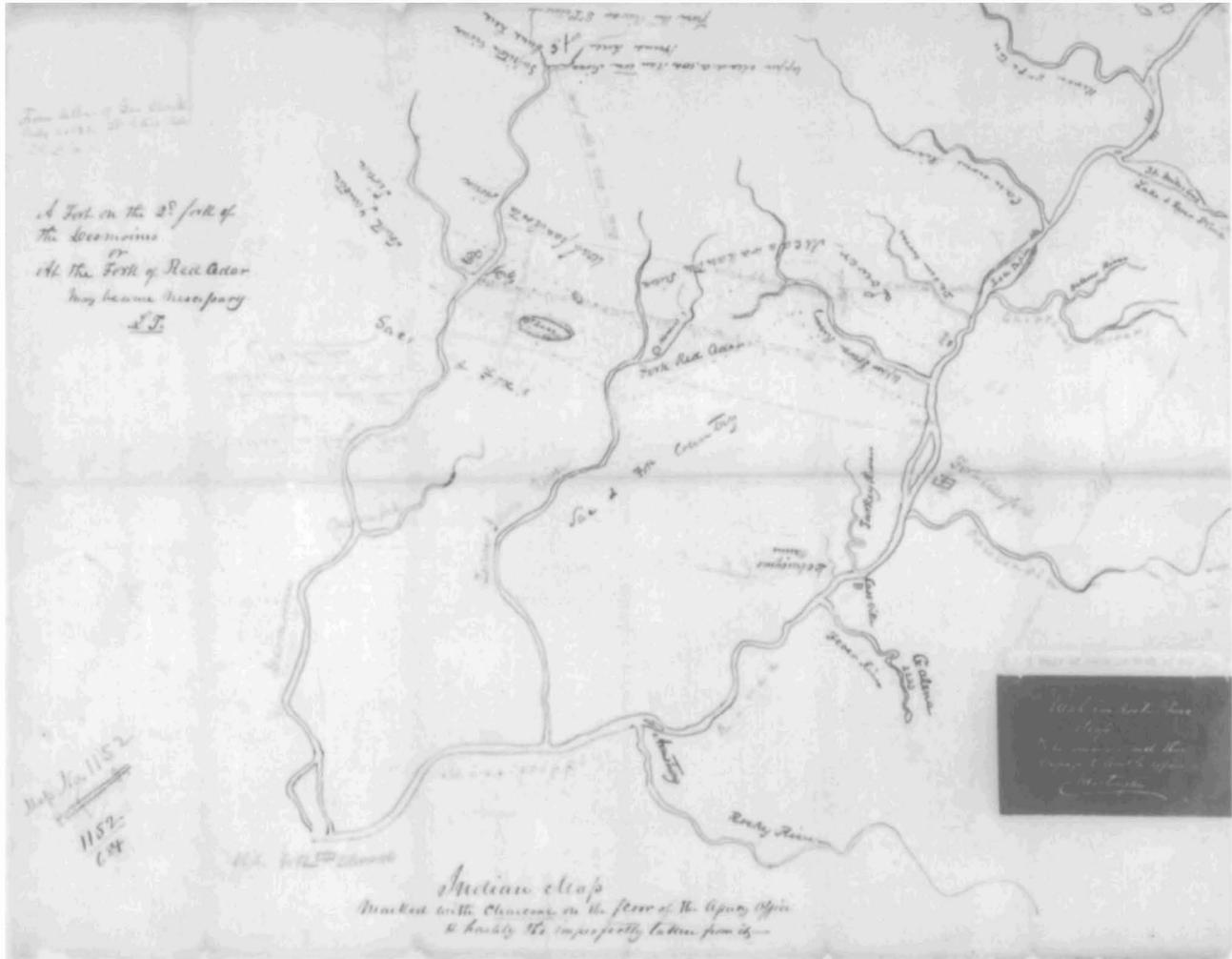


FIG. 4.61. MAP OF THE UPPER MISSISSIPPI VALLEY, IN LARGE PART COPIED FROM A WAH PAA KOO TA SIOUX MAP, CA. 1833. Sketch on paper. The note at the bottom of the map states, "Indian Map Marked with Charcoal on the floor of the Agency Office & hastily tho imperfectly taken from it."

senting nights' sleeps. Some of these are associated with pictographs representing distinctive conditions, such as poplar, berries, or woods. The spacing between adjacent dots varies, perhaps as a consequence of varying terrain. Whether the circles on Ki oo cus's map were used to represent tipis in plan is not known.

In the Appalachians, with their even, tree-covered ridge crests, it would have been surprising if Indians had found it necessary to represent specific summits.²⁵⁰ The peaks of the Rocky Mountains at the edge of the Plains were more distinctive, however, and their summits were important not merely as landmarks, but as mythically endowed or totemic sites. Ki oo cus's map represented the Rocky Mountains as a smooth line with a superimposed wavy

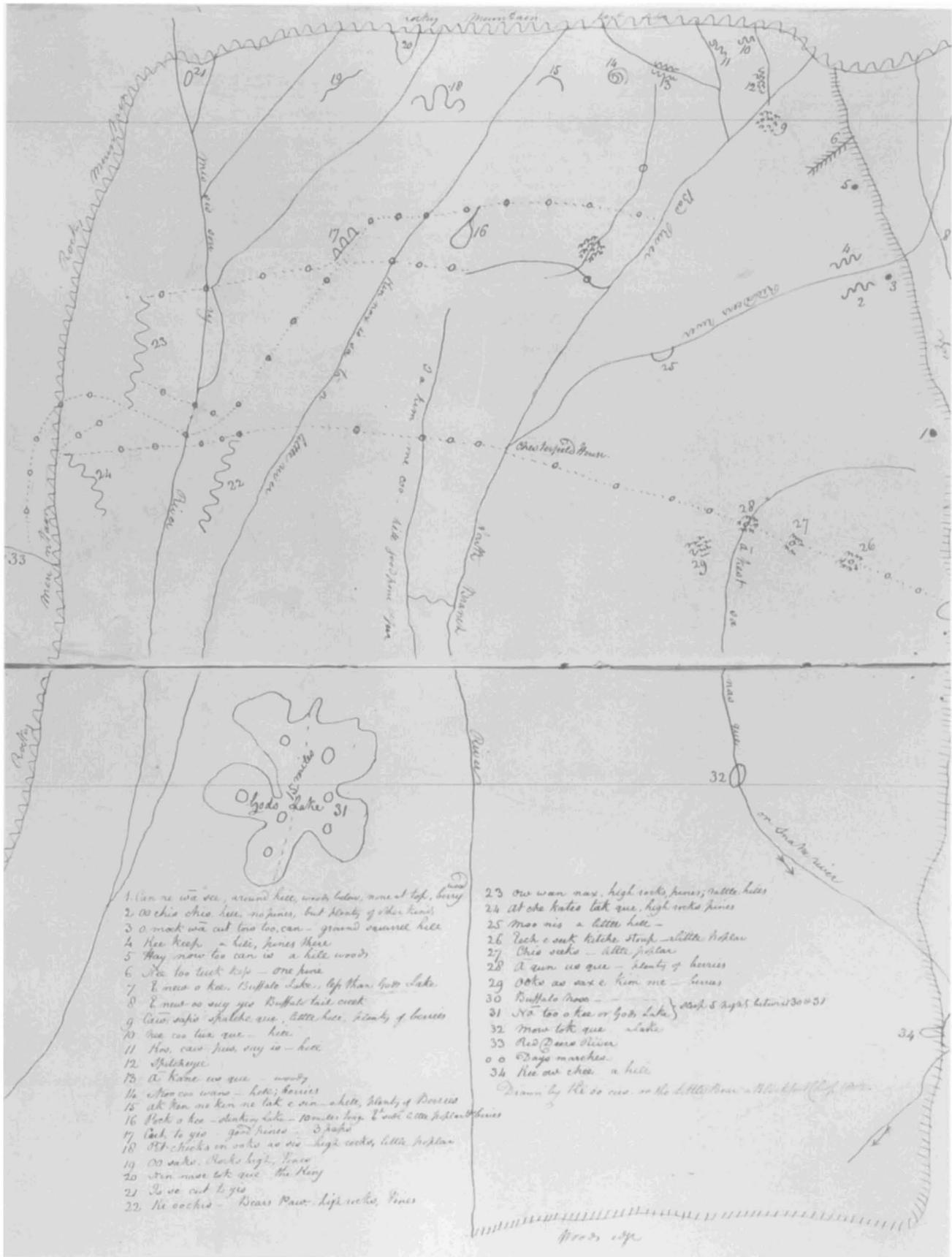
250. For example, figure 4.43.

Size of the original: 45.5 × 63 cm. Photograph courtesy of the Records of the Bureau of Indian Affairs, National Archives, Washington, D.C. (RG 75, Central Map File no. 1152).

(Facing page)

FIG. 4.62. KI OO CUS'S MAP OF THE PRAIRIES AND ROCKY MOUNTAIN PIEDMONT IN WHAT ARE NOW NORTHERN MONTANA AND SOUTHERN ALBERTA. Map of the Missouri and South Saskatchewan headwaters, Blackfoot, 1802. Untitled map of the area from the Red Deer River south to the Missouri River "Drawn [for Peter Fidler] by Ki oo cus or the Little Bear, a Blackfoot Chief 1802." Ink over pencil on paper. This is perhaps the last in a tradition of maps representing the grassland-forest transition as a boundary line—the "woods edge." The Hudson's Bay Company Archives possesses another contemporary transcript of this map in a post journal (B39/a/2, fols. 85v–86).

Size of the original: 48.5 × 38 cm. Photograph courtesy of the Hudson's Bay Company Archives, Provincial Archives of Manitoba, Winnipeg (E3/2, fols. 104d–105).



line on the border of the map, apparently a simpler stylized form of the hill-in-profile pictograph, but it also contains several less stylized hill-in-profile pictographs. Representing individual foothills of the eastern Rockies, each is unique in shape, suggesting that Fidler's transcript was fairly close to the original. Numerically keyed to an explanatory text, "3 paps" are represented by three breastlike profiles, "little hill" by a small semicircle, and "the King" as the largest and most peaked of all the symbols.

Two similar maps made for Fidler by another Blackfoot Indian, Ac ko mok ki (the Feathers, also known as the younger Old Swan), in 1801 and 1802 identify individual peaks in the Rockies. Fidler's transcript of the earlier of the two represents the Rocky Mountains from what is now central Wyoming to southern Alberta. The Rocky Mountains are represented by a closely spaced pair of essentially straight lines, along which semicircles and points indicate peaks. These are named by Fidler in an "Explanation" in both Blackfoot and English.²⁵¹ The map is well known and has been authoritatively interpreted.²⁵² Several of the peaks are still known by Fidler's English translations.

The second, less widely known, map made by Ac ko mok ki in the following year showed a somewhat smaller area but included most of the same stretch of the Rocky Mountains (fig. 4.63). This second map was less rich, and Fidler's explanation was much shorter, but in some respects his transcript appears to have been closer to the original. In particular, it retains totemic pictographs for summit features. There are five of these along the Rocky Mountains: in sequence, from south to north, a heart, a tooth, a pap, a second heart, and a "human" head and shoulders in profile. Respectively, these have been identified as Heart Mountain in the central front of the Absaroka Range, Beartooth Mountains farther north in the same range, Teton Peak (*teton* means breast or pap) on the upper waters of the Teton River in northwest Montana, Heart Butte in the central foothills of the Lewis Range, and Devil's Head Mountain at the east end of Lake Minnewanka, Alberta.²⁵³

An Oto map of the northern and central Plains made in 1825 by Gero-Schunu-Wy-Ha represents activities involving Euro-Americans (two details are illustrated here, figs. 4.64 and 4.65). The legend on the map states that Gero-Schunu-Wy-Ha was a member of the Oto war party whose route was traced on the map. The Indian-Euro-American councils marked on the map relate to the Atkinson-O'Fallon peace expedition of 1825. That expedition was seeking to improve relations and make treaties with the Indian nations of the Missouri with the intention of protecting and stimulating the fur trade.²⁵⁴ The extant transcribed version of the map has descriptive annotations, but the events are also represented pictographically.

Events on the upper Arkansas River are marked by dots: in carefully drawn lines to show the outward and return traces of "a war party of five Ottoes against the Arapahoes," and in a cluster, near what is almost certainly the watershed between the headwaters of the Huerfano River to the north and those of the Canadian and Cimarron Rivers to the south, to mark the "battle ground" where presumably the "Three Arapahoes were Killed & five more taken." Somewhat unusual for an Indian map, the terrain to the southwest is represented in profile (fig. 4.64). The pictography on this southern part of the map is less rich and varied than for the Missouri River section shown in figure 4.65, where a line of directionally oriented hoof-shaped symbols indicates the "Trace of Capt Armstrongs troop & the three Indians" and elsewhere "Capt Armstrongs trace." (Armstrong's contingent of forty men, along with three Indians including Gero-Schunu-Wy-Ha, accompanied the land-based part of the Atkinson-O'Fallon expedition ascending the Missouri River.) The hoof-shaped symbols go from Council Bluffs (just north of what is now Omaha, Nebraska) up the Missouri River to a council of Indians held somewhere near the present site of Pierre, South Dakota. One aspect of

251. "An Indian map of the Different Tribes that inhabit on the East & west side of the Rocky Mountains with all the rivers & other remarkable places, also the Number of Tents. &c. Drawn by the Feathers or ac ko mok ki—a Blackfoot chief—7th Feby. 1801—reduced ¼ from the Original Size—by Peter Fidler." Endorsement on transcript drawn on paper, 37.2 × 47 cm, Hudson's Bay Company Archives, Winnipeg (G1/25); there is also a transcript of this map in the archives (E3/2, fols. 106d–107).

252. D. Wayne Moodie and Barry Kaye, "The Ac Ko Mok Ki Map," *Beaver*, outfit 307 (spring 1977): 4–15.

253. This interpretation is derived from Moodie and Kaye, "Ac Ko Mok Ki Map," 6–9 (based on the earlier 1801 map); Judith Hudson Beattie, "The Indian Maps Recorded by Peter Fidler, 1801–1810," unpublished paper presented at the Eleventh International Conference on the History of Cartography, Ottawa, July 1985, esp. 2–3; and idem, "Indian Maps in the Hudson's Bay Company Archives: A Comparison of Five Area Maps Recorded by Peter Fidler, 1801–1802," *Archivaria* 21 (1985–86): 166–75, esp. 170 and 174. The Hudson's Bay Company Archives possesses another contemporary transcript of the map: "Drawn by the Feathers or ak ko mok ki a Blackfoot Chief 1802" (E3/2, fol. 104). It is reproduced and the circumstances of its making are used as evidence in a paper arguing that "among most Native groups in Canada, the local or residential band, not the tribe, was the basic social, political, and economic entity." Theodore Binnema, "Old Swan, Big Man, and the Siksika Bands, 1794–1815," *Canadian Historical Review* 77 (1966): 1–32, esp. 1 and 23–24 including fig. 2. Ac ko mok ki's maps and maps by other Blackfeet have been used as evidence in arguing the case that "twentieth-century historians of cartography could discover the richness of mapping conventions very different from their own if they opted for intercultural dialogue rather than translation." Barbara Belyea, "Inland Journeys, Native Maps" (note 2).

254. R. Raymond Wood, comp., *An Atlas of Early Maps of the American Midwest* (Springfield: Illinois State Museum, 1983), pl. 16, and Russell Reid and Clell G. Gannon, eds., "Journal of the Atkinson-O'Fallon Expedition," *North Dakota Historical Quarterly* 4 (1929): 5–56, esp. 7.

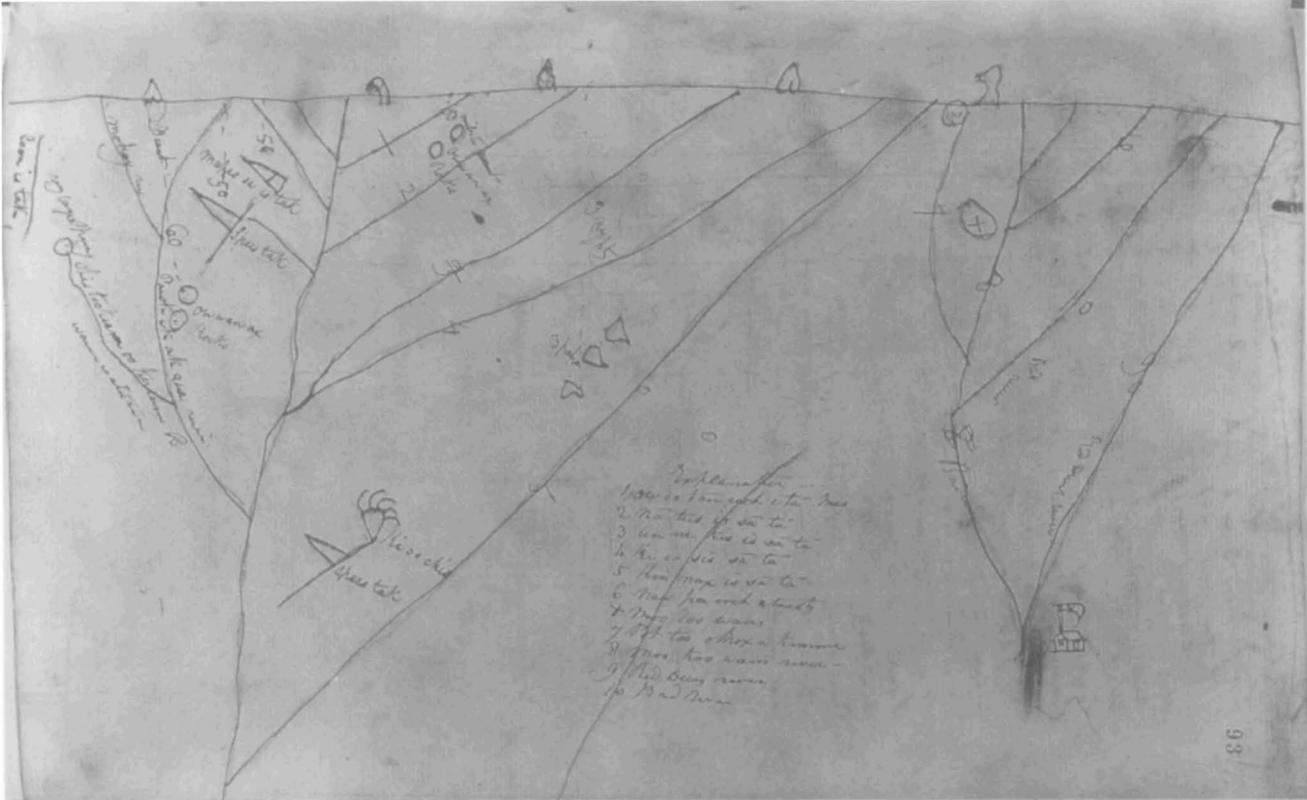


FIG. 4.63. AC KO MOK KI'S MAP OF THE UPPER MISSOURI AND UPPER SASKATCHEWAN RIVERS AND THEIR SOURCES IN THE ROCKY MOUNTAINS, 1802. Unendorsed transcript drawn in post journal by Peter Fidler, ink on paper, of a map of the upper Missouri and upper South Saskatchewan River catchments in the northern Rocky Mountains, originally drawn by Ak ko mok ki (also known as the Feathers and, after the death of his father, as the younger Old Swan), a Blackfoot chief. The most basic of three contempo-

rary copies, the retention of totems and the exclusive use of Indian names are significant. All five totemic peaks are in the eastern front ranges of the Rocky Mountains, on or close to the primary watershed, and visible on the western horizon from Blackfoot territory on the grassy plains or plateaus to the east.

Size of the original: 20 × 32 cm. Photograph courtesy of Hudson's Bay Company Archives, Provincial Archives of Manitoba, Winnipeg (B39/a/2, fol. 93).

this is intriguing. A return journey is shown, but only for a very short distance.²⁵⁵ See figure 4.66 for identification of the hydrographic features on Gero-Schunu-Wy-Ha's map.

Permanent villages of named Indian nations are represented by clusters of dots, the number differing from village to village. Most villages have an inner cluster of dots surrounded by a circle with an outer scatter of further dots. Whether the dots represent the population or permanent lodges and the significance of their arrangement is not clear. Temporary camp and council sites are represented by clusters of acute V-shaped tipi symbols. One of these, a council between the Mandans, Gros Ventres, and Crows, has pictographic drawings of Indians on horseback associated with it (see the top of fig. 4.65). The extant map is almost certainly a transcript, presumably done by the person responsible for the annotations. If so the pictographs may have lost some of their original detail, and hence meaning. Nevertheless, together with the tipi and hoof symbols and the pictographic terrain

profiles, they are closely related in style to nineteenth-century Plains Indian art, especially paintings on bison robes. Part of the map represents that section of the Missouri River painted by Sitting Rabbit eighty years later (fig. 4.58 above). Gero-Schunu-Wy-Ha's map is stylistically and structurally more indigenous than Sitting Rabbit's. This is what one would expect for a region that in 1825 had barely begun to be acculturated by contacts with Euro-Americans but by the early twentieth century had experienced the full impact of that remorseless process.

255. Another interestingly marked route can be found on a published transcript of a Hidatsa map of a horse-stealing expedition from Fort Berthold to Fort Buford on the upper Missouri River. It represents the outward journey on foot by means of dashes that are neither shaped or positioned in relation to each other as having been made by a biped. The direction of the journey is interpretable only in the context of the message as a whole; including the return journey, represented by the directionally oriented hoof marks of the captured horse(s). Mallery, "Picture-Writing," fig. 452, p. 342 (note 4).



FIG. 4.64. DETAIL FROM GERO-SCHUNU-WY-HA'S MAP OF THE CENTRAL AND NORTHERN GREAT PLAINS, 1825. "This Map was sketched by an Otto [Oto] indian Called in that language Gero-schunu-wy-ha i.e. the man that is very sorry—He was a member of the war party traced heron [*sic*]—Aug. 12 1825 Missouri River," annotated transcript in ink on paper. The map combines in approximately equal proportions the characteristics of utilitarian line maps and the artistically richer pictorial tradition. This section shows the activities of a war party in the valley of the upper Arkansas River above Horse Creek.

Size of the entire original: 53 × 42 cm; size of detail: ca. 25 × 14 cm. Photograph courtesy of the National Archives, Washington, D.C. (RG 75, map 931).

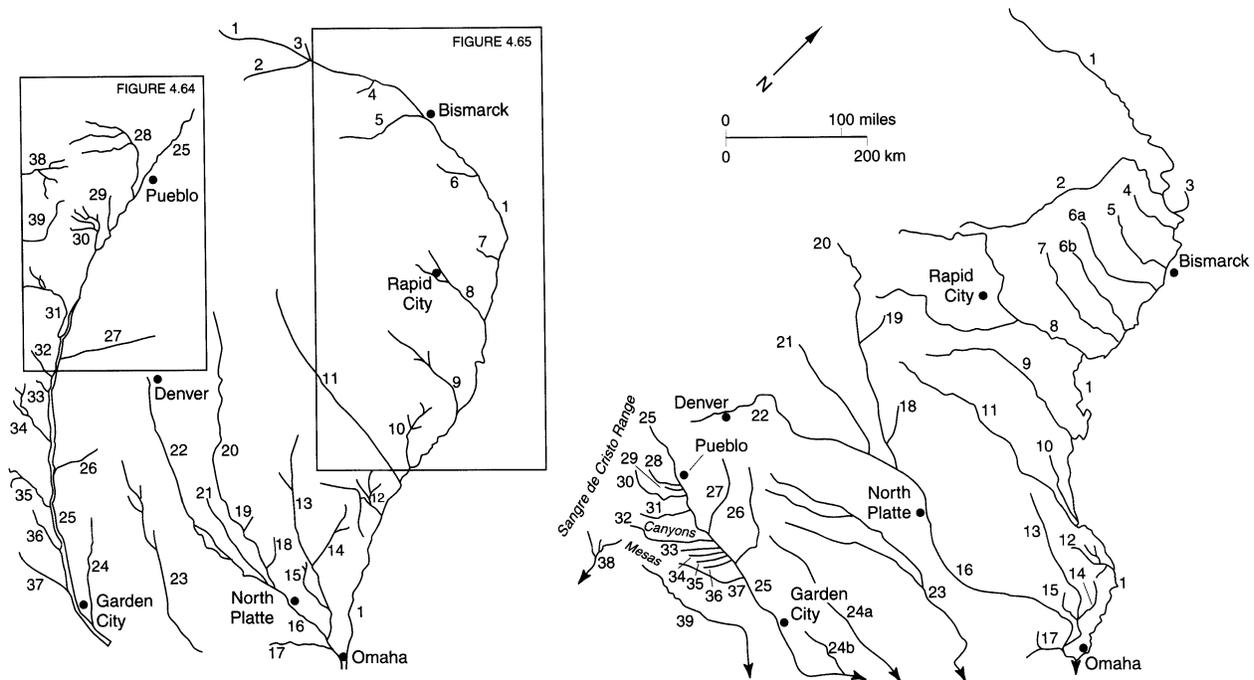
A map by Non-Chi-Ning-Ga, an Iowa Indian, was presented at a council between several native groups held in Washington, D.C., in 1837 to show "the land we have al-



FIG. 4.65. ANOTHER DETAIL FROM GERO-SCHUNU-WY-HA'S MAP, SHOWING EVENTS ON THE MISSOURI RIVER. The complicated events may have been associated with the several treaties agreed in this region in the summer of 1825, some of them witnessed by Captain William Armstrong. This detail is of the Missouri Valley above the Niobrara confluence.

Size of the entire original: 53 × 42 cm; size of detail: ca. 35 × 19 cm. Photograph courtesy of the National Archives, Washington, D.C. (RG 75, map 931).

ways claimed." The center on the map (fig. 4.67) is the area between the Mississippi and Missouri Rivers in what is now mainly Iowa and northern Missouri. Placed central to the sheet of paper, this interriverine area contains the routes of the Iowas' late prehistoric migrations and, though not identified as such, the lands ceded to the United States by the Iowas and others at the treaty of 15 July 1830. The Iowas were still in dispute with the



- | | | | | |
|--|------------------------------|--|----------------------|---------------------------------|
| 1. Missouri River | 9. White River | 18. Blue Creek | 25. Arkansas River | 34. Caddou Creek |
| 2. Little Missouri River | 10. Ponca Creek | 19. Rawhide Creek | 26. Big Sandy Creek | 35. Mud Creek |
| 3. Douglas Creek | 11. Niobrara River | 20. North Platte River | 27. Horse Creek | 36. Clay Creek |
| 4. Knife River | 12. Bow Creek | 21. Lodgepole Creek | 28. Charles River | 37. Two Butte Creek |
| 5. Heart River | 13. Elkhorn River | 22. South Platte River | 29. Sixmile Creek | 38. Canadian River (headwaters) |
| 6. Cannonball River (6a) or Grand River (6b) | 14. North Fork Elkhorn River | 23. Republican River | 30. Huerfano River | 39. Cimarron River (headwaters) |
| 7. Moreau River | 15. Maple Creek | 24. Smoky Hill River (24a; misconnected) or Walnut Creek (24b) | 31. Apishapa River | |
| 8. Cheyenne River | 16. Platte River | | 32. Purgatoire River | |
| | 17. Salt Creek | | 33. Rule Creek | |

FIG. 4.66. INTERPRETATION OF THE HYDROGRAPHY OF GERO-SCHUNU-WY-HA'S MAP OF THE CENTRAL AND NORTHERN GREAT PLAINS. On the left is a tracing of Gero-Schunu-Wy-Ha's map and on the right a modern map of the same area; northwest is at the top. See also figures 4.64 and 4.65.

United States government about aspects of the treaty and were to remain so until 19 October 1838, when the maker of the map was the second of six Iowas to sign a clarifying treaty.²⁵⁶ A notable characteristic of the map is the relatively straight river courses. Dots ranging in number from two to eight within circles represent former settlement sites. Figure 4.68 shows the area depicted on the map.

SUBARCTIC

The native people of the Subarctic are Athapaskan and Algonquian speakers occupying much of present-day Canada and the interior of Alaska. Perhaps now there are no more than sixty thousand people, divided among many small bands and scattered across some 3.2 million square kilometers.²⁵⁷ Traditionally they were hunters and fishermen, with a nomadic lifestyle closely linked to the seasonal migrations of the caribou. Only briefly, in the summer, did the small bands rendezvous in larger groups, but loose affiliations between bands were important, especially in maintaining networks of communication. Migrations of caribou herds were generally predictable, but

unexpected deviations were quickly detected by dispersed bands that could "report on the direction of movement, dispersal and concentration of the caribou."²⁵⁸ Whether or not they were communicated cartographically, the messages were eminently spatial. Animal distributions and migrations were among the most important of the maplike elements discerned in scapulimancy and produced in birchbark biting.

MAPS ON BARK AND SKIN

As in the Northeast, Indians in the Subarctic used the bark of the paper birch for many purposes, including

256. The two treaties can be found in Charles J. Kappler, comp. and ed., *Indian Affairs: Laws and Treaties*, 5 vols. (Washington, D.C.: United States Government Printing Office, 1904-41), 2:305-10 and 518-19.

257. Colin Taylor, "The Subarctic," in *The Native Americans: The Indigenous People of North America* (New York: Smithmark, 1991), 182-203, esp. 182.

258. James G. E. Smith, "Economic Uncertainty in an 'Original Affluent Society': Caribou and Caribou Eater Chipewyan Adaptive Strategies," *Arctic Anthropology* 15, no. 1 (1978): 68-88, esp. 68.

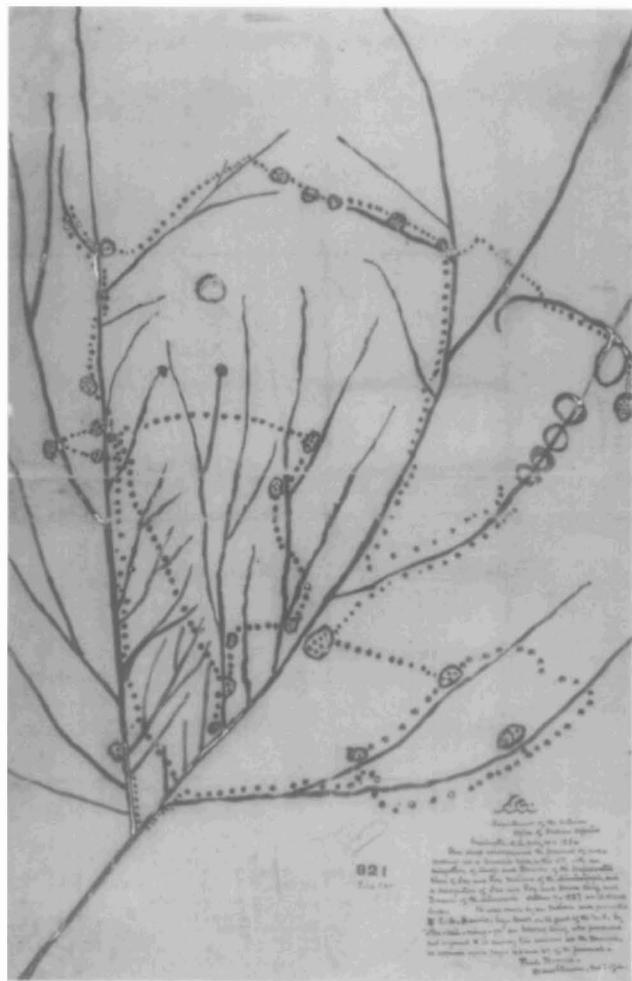


FIG. 4.67. NON-CHI-NING-GA'S MAP OF THE MIGRATION OF HIS INDIAN ANCESTORS, 1837. Untitled manuscript map on paper of the upper Mississippi and Missouri Rivers drainage systems between Lake Michigan and the northern Great Plains. The map shows "the route of my [Iowa] forefathers—the land we have always claimed." The original was presented by Non-Chi-Ning-Ga at a congress in Washington, D.C., 7 October 1837. The Sauks and Foxes were about to sell a vast area of prime farmland, and the Iowas were afraid they in turn would be pressured by their dispossessed but powerful neighbors.

Size of the original: 104 × 69 cm. Photograph courtesy of the Cartographic Branch, National Archives, College Park, Maryland (RG 75, map 821, tube 520).

making maps. One account of the construction of a birch-bark map for cartographic briefing suggests the way such maps may have been used among Indians before European contact. In the summer of 1861, Henry Youle Hind was leading an expedition up the Moisie River in eastern Quebec. The abbé Ferland, of Laval University, Quebec, had showed him a chart constructed by seven Montagnais Indians. "The chart exhibited the route followed by these Indians from Hamilton Inlet on the Atlantic coast [of Labrador] . . . to a great lake in the interior . . . to near

the head waters of the east branch of the Moisie, which they reached by crossing a low water parting, and descended to the Gulf of St. Lawrence."²⁵⁹

One of the expedition's goals was to test the accuracy of the Montagnais map, about which nothing else is known. Evidently it was not adequate to travel by. Louis and Pierre, Hind's Montagnais and Abenaki guides, soon became unsure of the way ahead. Still on the lower Moisie River, Louis tried to persuade Dominique (a Montagnais man) and an unnamed Naskapi youth to serve as guides to and beyond its headwaters. He then advised Hind to give the two a good meal and allow them to rest, after which the following exchange took place:

"Where are you going to, Louis?" some one enquired, as the Indian was rolling off into the woods with a torch of birch-bark, about an hour after supper.

"Get birch-bark for map."

"What map?"

"Domenique going to make map of portages, to show us the way. To-morrow," continued Louis, with a knowing leer, "I speak to Domenique about young Nasquapee; Domenique well pleased—like supper, like tobacco, like everything. Think he will let young Nasquapee go."

. . . Louis returned with the sheet of fresh birch-bark for Domenique to draw his map on.²⁶⁰

We sat by the fire till a late hour talking to Domenique and the young Nasquapee. The lad appeared to be very intelligent, and apparently knew the upper country well. He and Domenique together constructed a map of the Moisie and the old Montagnais route, as far as the dividing ridge [watershed]—showing the point where the Ashwanipi [Ashuanipi] River took its rise, and began its long course of several hundred miles to Hamilton Inlet, on the Atlantic coast of Labrador.

He put in all the portages, and explained the map to Louis and Pierre. The latter took charge of the map, and before we rose went over every little detail to see if he understood it perfectly.²⁶¹ [See figs. 4.69 and 4.70]

Maps were also made on skin. There is a mention of one made in 1722 by two Chipewyans "on parchment with charcoal."²⁶² It appears to have represented a large area: the west coast of Hudson Bay from Churchill and in all probability the Arctic coast of what is now mainland Canada as far west as the Coppermine River. It is possible that it was only one of the generation of maps

259. Henry Youle Hind, *Explorations in the Interior of the Labrador Peninsula, the Country of the Montagnais and Nasquapee Indians*, 2 vols. (London: Longman, Green, Longman, Roberts, and Green, 1863), 1:10.

260. Hind, *Explorations in the Interior*, 1:83–84.

261. Hind, *Explorations in the Interior*, 1:88.

262. Johann Reinhold Forster, *History of the Voyages and Discoveries Made in the North* (London: G. G. J. and J. Robinson, 1786), 388.

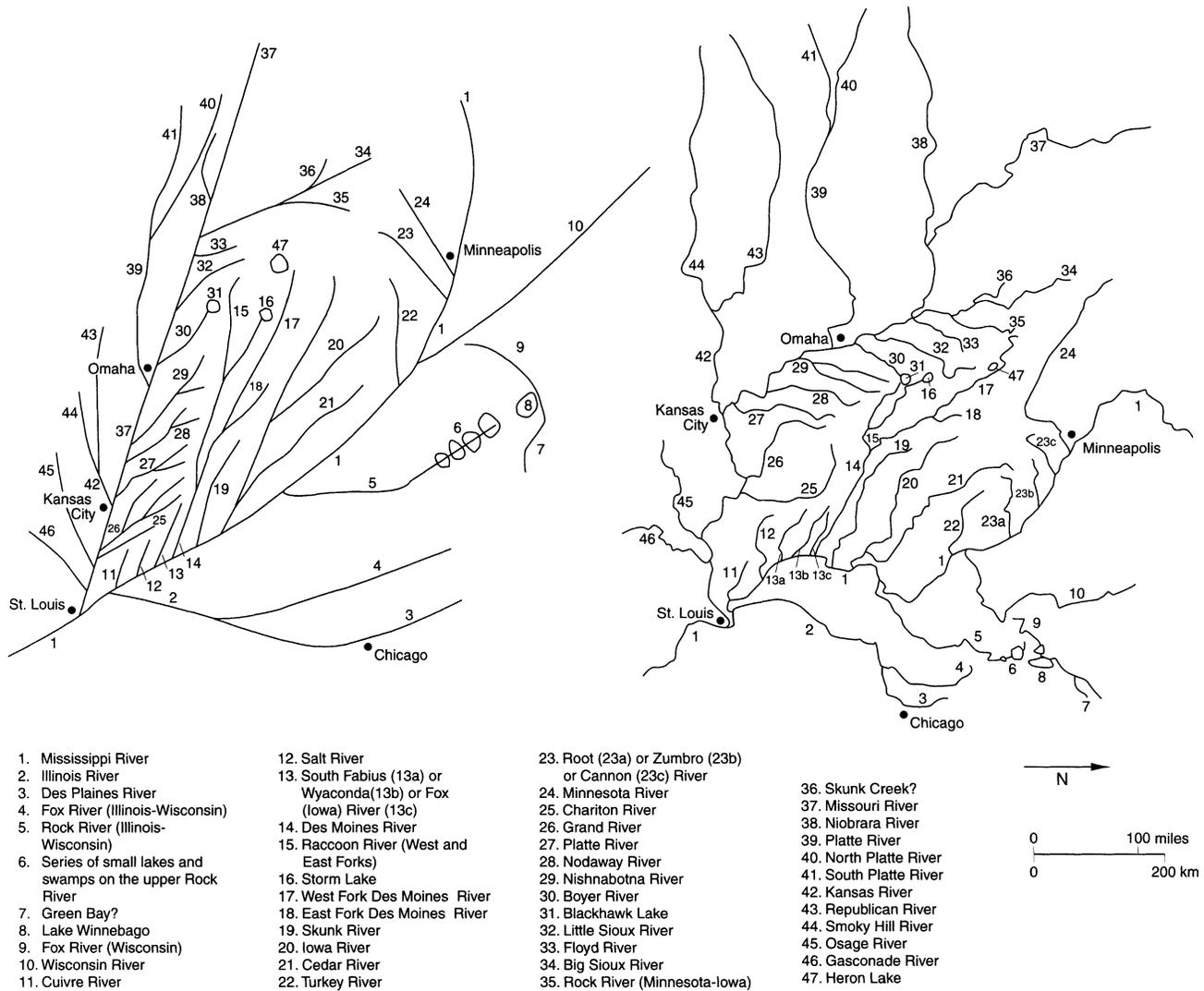


FIG. 4.68. INTERPRETATION OF THE HYDROGRAPHY OF NON-CHI-NING-GA'S MAP. On the left is a tracing of Non-Chi-Ning-Ga's map and on the right a modern map of the same area; west is at the top.

that John Barrows referred to as "rude charts painted on skins by the Indians, which, though without scale or compass, mark the inlets from Hudson's Bay with tolerable accuracy, and carry the coast without interruption to the Coppermine River." A footnote indicates that "one of these charts is in the Hudson's Bay House."²⁶³ This probably refers to the map on parchment endorsed on the back: "Moses Nortons Drt. of the Northern Parts of Hudson's Bay laid dwn on Indn. Information & bro'. Home by him anno 1760" (figs. 4.71 and 4.72). It is not, however, "painted" but is done in pencil with toponyms and annotations in ink. The pencil work may or may not have been done by the Chipewyans who supplied the information to Norton, a Hudson's Bay Company official. There is no doubt that the skin is genuine, and it is probably the oldest extant skin map from the Subarctic.²⁶⁴

Falls and rapids, significant as obstacles and hazards to

canoe travel and as locations for fishing and for trapping small mammals that preyed on fish, are marked on the map by one or more transverse strokes, but it is not clear what determines the number or spacing of sets of strokes. One line per fall might seem probable, but present-day evidence suggests that the strokes may have subtly conveyed information about the characteristics of falls and rapids and not necessarily their number.²⁶⁵ If this subtle

263. John Barrow, *A Chronological History of Voyages into the Arctic Regions; Undertaken Chiefly for the Purpose of Discovering a North-east, North-west, or Polar Passage between the Atlantic and Pacific* (London: John Murray, 1818), 376.

264. The oldest from North America, the unauthenticated "map" on skin dated "Moi 1607," fig. 4.31, is more like a profile than a map.

265. In April 1975 Henry Kakekayash, a Weagamow Lake Ojibwa, drew eight types of rapids, distinguishing between them on the basis of a mix of characteristics: length, water speed, presence or absence of



FIG. 4.69. PAINTING OF DOMENIQUE DRAWING A MAP ON BIRCHBARK, 1861. By William George Richardson Hind (1833–89) while on an expedition to the Moisie River, eastern Quebec, led by his brother Henry Youle Hind. At the first rapids, the Naskapi guides sought the advice of a Montagnais, Dominique, concerning the route ahead. He is here shown in a detail from the painting making a map of the upper Moisie River as the first stage in his response. Size of the original: 27.9 × 40.6 cm; this detail: ca. 12 × 12 cm. Photograph courtesy of the Metropolitan Toronto Reference Library (John Ross Robertson Collection, T31956).

and variable pictography was used in the eighteenth and nineteenth centuries, it is possible that Europeans may not have recognized its significance and hence may have made simplified transcripts. Although particularly characteristic of the Subarctic, lines for falls and rapids were not unique to that region (see, for example, their use to denote the falls on the Susquehanna River on fig. 4.18 above).

Another map on skin was revealed in relatively recent times but appears to exemplify a much older tradition. Formal hearings were held between Beaver Indians and officials of the Northern Pipeline Agency in the early winter of 1979–80. These concerned the likely impact of the proposed pipeline on the Indians' traditional life and economy in northeastern British Columbia, and many specially prepared thematic maps had been exhibited. At the end of the day, when the officials considered the proceedings to be over, a husband and wife brought a moose-hide bundle into the hall:

Neither Aggan nor Annie had spoken earlier in the day, but they went directly to the table at which the elders had sat. There they untied the bundle's thongs



FIG. 4.70. MONTAGNAIS CHIEF DOMENIQUE EXPLAINING HIS MAP ON BIRCHBARK TO NASKAPIS, 1861. Watercolor and graphite with scraping, on commercially prepared colored paper. In this painting, William George Richardson Hind shows Dominique using the map he made (fig. 4.69) to advise the Naskapi guides, Louis and Pierre, concerning the route to the source of the Moisie River, and across the watershed into the Churchill River system of Labrador. In this he was assisted by an unnamed Naskapi youth, presumably the kneeling figure in profile. Size of the original: 17.8 × 26.6 cm; this detail: ca. 11 × 12 cm. Photograph courtesy of the Art Gallery of Hamilton, Ontario (Bert and Barbara Stitt Family Collection, 84.STI.61).

and began very carefully to pull back the cover. At first sight the contents seemed to be a thick layer of hide, pressed tightly together. With great care, Aggan took this hide from its cover and began to open the layers. It was a magnificent dream map.

The dream map was as large as the table top, and had been folded tightly for many years. It was covered with thousands of short, firm, and variously coloured markings. The [Indian] people urged the chairman and other white visitors to gather round the table. Abe Fellow and Aggan Wolf explained. Up here is heaven; this is the trail that must be followed; here is a wrong direction; this is where it would be worst of all to go; and over there are all the animals. They explained that all of this had been discovered in dreams.

rocks, suitability for canoe travel, potential for fish, suitability for constructing fish traps, and access for mammalian predators. The subtly variable spacing of ladder-like lines drawn transverse to rivers (with lakes, confluences, etc.) as represented in plan is reminiscent of transcripts of eighteenth- and nineteenth-century Indian maps. Edward S. Rogers and Mary B. Black, "Subsistence Strategy in the Fish and Hare Period, Northern Ontario: The Weagamow Ojibwa, 1880–1920," *Journal of Anthropological Research* 32 (1976): 1–43, esp. 8 (fig. 2).

Aggan also said that it was wrong to unpack a dream map except for very special reasons. But the Indians' needs had to be recognized; the hearing was important. Everyone must look at the map now. Those who wanted to might even take photographs. They should realize, however, that intricate routes and meanings of a dream map are not easy to follow. There was not time to explain them all. The visitors [mainly non-native Canadians and Americans] crowded around the table, amazed and confused. The centre of gravity had suddenly shifted away from procedural concerns, pipelines and terms and conditions, to the Indians' world.

A corner of the map was missing and one of the officials asked how it had come to be damaged. Aggan answered: someone had died who would not easily find his way to heaven, so the owner of the map had cut a piece of it and buried it with the body. With the aid of even a fragment, said Aggan, the dead man would probably find the correct trail, and when the owner of the map died, it would all be buried with him.²⁶⁶

Much larger than other known skin maps, the Beaver Indians' dream map was a truly indigenous artifact. Such artifacts, made on durable hides and carefully preserved, would have the potential for long life, but they would be lost to view on the death of their owners. Presumably there have been many such maps.²⁶⁷

Among the Beaver Indians, and perhaps other northern Athapaskans, models of the cosmos are painted on the skin heads of shamans' ceremonial drums. Typically these portray the shamanic cosmic structure familiar in many societies: a central vertical *axis mundi* joining the upper and lower supernatural worlds (sky and Underworld) with the natural world of the earth. The horizontal axis consists of the four cardinal points in the earth plane, whose center is the gateway to the upper and lower worlds through which the shaman magically flies into the hidden inner experiential dimension. Each of the cardinal directions is associated with a color, a time of day, a season, a gender, and a quality (e.g., good, dangerous). At the center, all these attributes (male and female, warm and cold, benevolent and harmful) meet and are joined in one whole. A clockwise progression around the circle of directions symbolizes infancy, childhood, and the adolescent vision quest.²⁶⁸ In figure 4.73, reproducing a circular model painted about 1915, the cross at the center symbolizes the place of creation: the Beaver Indians' creation myth involves the Creator's drawing a cross on the surface of the water and sending animals down to find land. When the muskrat came up with a speck of dirt under his nail, the Creator took it and placed it as the earth at the center of the cross on the water and told it to grow. The two inner circles represent the two supernatural worlds.

The lines slanted outward from the cross lead to the hatched path to heaven, discovered by the culture hero Saya on his vision quest.²⁶⁹

SCAPULIMANCY

Scapulimancy is a form of divination in which random cracks and burns are induced on the scapula (shoulder blade) of a mammal (fig. 4.74). It was practiced in Eurasia as well as northern North America. Patterns were usually produced by heat (pyroscapulimancy), but percussion could also be used. In other cases divination could be based on the natural shape, color, and veining of the scapula. Divining often involved recognizing map-like patterns and relating these to known geographical features, usually lakes and rivers. True pyroscapulimancy was not reported in North America before the mid-nineteenth century,²⁷⁰ though it may well have been practiced unknown to Euro-Americans.

An early description of scapulimancy was written by Napoleon A. Comeau based on a lifetime of experience with the Montagnais. Comeau described a "custom . . . known as 'outlickan meskina,' the literal translation of which is 'shoulder blade track,'" rarely practiced in the presence of outsiders. The scapula of the caribou was preferred as "the most truthful, and most far-seeing."²⁷¹ The scapula was held over red-hot coals for a few seconds, causing the bone to crack in various directions, and the cracks were then interpreted. Some were "read" non-cartographically; for example, a short zigzag without branches meant much trouble and hardship. Much of the

266. Brody, *Maps and Dreams*, 266–67 (note 24).

267. Though there is no evidence that they were supposed to be destroyed on the death of their owners, the maps made in 1762 on skin by a Delaware preacher in the upper Ohio Valley appear to have had a very similar purpose (p. 91). Like the Beaver Indians in the late 1970s, the Delawares' lifestyle in 1762 was under pressure from European and Euro-American settlers, and their preacher's maps showed the relation between their former home, the land in the upper Ohio Valley to which they had been displaced, and the afterworld, to which the route was difficult (see fig. 4.34).

268. Robin Ridington and Tonia Ridington, "The Inner Eye of Shamanism and Totemism," *History of Religions* 10 (1970): 49–61, esp. 51–52.

269. Robin Ridington, "Beaver," in *Handbook of North American Indians*, ed. William C. Sturtevant (Washington, D.C.: Smithsonian Institution, 1978–), 6:350–60, esp. 354, and Ridington and Ridington, "Inner Eye."

270. With the exception of a brief mention in 1634 of the practice among the Algonquian-speaking natives around Quebec; see John M. Cooper, "Scapulimancy," in *Essays in Anthropology Presented to A. L. Kroeber in Celebration of His Sixtieth Birthday, June 11, 1936*, ed. Robert H. Lowie (Berkeley: University of California Press, 1936; reprinted, 1968), 29–43, esp. 29.

271. Napoleon A. Comeau, *Life and Sport on the North Shore of the Lower St. Lawrence and Gulf*, 3d ed. (Quebec: Telegraph Printing, 1954), 264.



FIG. 4.74. SCAPULA USED FOR DIVINATION. These hare shoulder blades were collected by Frank G. Speck, Lac Saint-Jean, Quebec, in 1931.

Sizes of the originals: ca. 5.5×3 cm and 5.9×3.2 cm. Photograph courtesy of the University of Pennsylvania Museum, Philadelphia (31-7-171 and 31-7-172; neg. 54-102140).

showing a Lake St. John Montagnais hunter which branch of a river he should hunt, along with a birchbark map made by the same Indian of the hydrological referents: the "Atikwabe'o" and its tributary the "Kak~ste'namickcipic, 'Black Beaver River'" draining into Lake St. John (Lac Saint-Jean).²⁷⁷

The ecological and social functions of scapulimancy are matters of debate. Moore has argued that among the Naskapis it randomized hunting patterns, so that the caribou could not learn to anticipate the behavior of the hunters.²⁷⁸ Henriksen thinks it probable that the Naskapis practiced scapulimancy only in critical decision-making situations, when it externalized the decision of where to seek caribou. "In this way, good hunters could blame a possible failure on the shoulder-blade and hence safe-guard themselves; it would then become easier to take the initiative to go hunting in critical situations."²⁷⁹ Whatever the indirect consequences and however important they may have been ecologically and socially, they stemmed from reading as maps the patterns randomly induced on bone.²⁸⁰

DESIGN BITING

Other randomly produced patterns that were sometimes read as trail maps were made by an indigenous process known as birchbark biting or design biting. Practiced by Subarctic Algonquian groups and usually done by women, it involved folding a thin sheet of birchbark and compressing it between the teeth to make symmetrical

patterns (fig. 4.75). In recent times at least, descriptions by the Montagnais of chance or error patterns sometimes involved the concept of a trail map: "started to make trees, but trails came out"; "hunter's trails"; and "tents and connecting trail."²⁸¹ Neither the regional extent nor the historical origins of birchbark biting are known, but in the twentieth century it has been reported as far west as the Southern Ojibwas of northern Minnesota and the West Wood Crees of northern Saskatchewan.²⁸² There is no way of determining whether early examples of bitten barks contained patterns intended to be or interpreted as trail maps, however.

Whereas pyroscapulimancy and birchbark biting are undoubtedly old and indigenous practices, it is not possible to demonstrate conclusively that recognizing maps in

277. Speck, *Naskapi*, 140–42 and 145–46, esp. figs. 12A and 14D. (Although Speck says they were done by the same hunter, the hunter is named Cimon in one place and Cibic in the other.)

278. Omar Khayyam Moore, "Divination—A New Perspective," *American Anthropologist* 59 (1957): 69–74, esp. 71.

279. Georg Henriksen, *Hunters in the Barrens: The Naskapi on the Edge of the White Man's World* (St. John's: Institute of Social and Economic Research, Memorial University of Newfoundland, 1973), 49.

280. Related to scapulimancy were the divination practices now known as scrying and pyromancy. Scrying involved peering for long periods at a smooth surface (traditionally, almost always water) to "see" distant things, viewed in something like plan, in order "to locate some feared enemy, stranger, or being in the bush"; John M. Cooper, "Northern Algonkian Scrying and Scapulimancy," in *Festschrift, publication d'hommage offerte au P. W. Schmidt*, ed. William Koppers (Vienna: Mechitharisten-Congregations-Buchdruckerei, 1928), 205–17, esp. 210. Scrying is mentioned in Thwaites, *Jesuit Relations*, 15:178, 17:210 (both in 1639), 33:192–94 (1648), and 39:20 (1653). Pyromancy, divination by fire, was observed by French Jesuits in the seventeenth century and sometimes had a cartographic function. In 1647 the Atikamek north of Trois-Rivières, Quebec, were reported to use it "to find animals in the woods, to discover if some enemy has not entered their lands, and for other similar purposes." In or just before 1635, the Jesuit Jean de Brébeuf saw an old woman foretell the fate of an Iroquois raid by means of small fires near a map of Lake Ontario drawn in the dirt. Thwaites, *Jesuit Relations*, 8:125 and 31:211 (note 113).

281. Frank G. Speck, *Montagnais Art in Birch-Bark, a Circumpolar Trait*, Indian Notes and Monographs, vol. 11, no. 2 (New York: Museum of the American Indian, 1937), 74–80, esp. pl. XIII. In the early twentieth century, of twelve experimental patterns made by biting folded pieces of birchbark, seven were interpreted to be maps of trails. The original bitten barks are in the Museum of the American Indian, New York (items 19/5763–19/5771, 19/5773–19/5775).

282. Accounts of bitten bark and birchbark biting, though not necessarily the recognition of maps on bark, include J. G. Kohl, *Kitchi-Gami: Wanderings Round Lake Superior* (London: Chapman and Hall, 1860), 412–14; Frances Densmore, *Chippewa Customs*, Bulletin of the Smithsonian Institution Bureau of American Ethnology 86 (Washington, D.C.: United States Government Printing Office, 1929), 184–85; and Harry Moody, "Birch Bark Biting," *Beaver*, outfit 287 (spring 1957): 9–11. The earliest account is found in Thwaites, *Jesuit Relations*, 63:291 (note 113), in a 1687 letter by Thierry Beschefer. The source of the bitten barks was not given, but Beschefer's sphere of influence was such that it could have been anywhere between the Maritimes and Lake Superior.

the chance patterns was equally old and entirely indigenous. Although it is unlikely, we cannot discount the possibility that it emerged after contact with Europeans and their maps. Furthermore, the practices were apparently characteristic of only one major North American region.

MAPS MADE DURING EUROPEAN-INDIAN INTERACTION

Some Subarctic Indian groups had sustained contact with Europeans, notably employees of the Hudson's Bay Company, starting in the eighteenth century. It is through this connection that many of the extant maps made by Subarctic Indians have survived. The company's efficient but secretive record-keeping preserved for posterity about three-quarters of the 837 manuscript maps (mostly on paper) known to have been made for it between 1670 and 1870. Of these, most are of Subarctic areas, and almost all are still in the company archives in Winnipeg. They include 16 maps drafted by native persons and 20 based on sketches or descriptions provided by natives. Most of these 36 maps were made by Subarctic Indians, and all were made after 1766.²⁸³ Many are of very large areas, combining two types of accumulated experience: north-south knowledge derived over many generations of following the caribou, and east-west knowledge derived over fewer generations of annual travel, often covering long distances, to bring pelts to the company's posts on the shores of Hudson Bay (see figs. 4.62, 4.63, 4.71, 4.78, 4.81, and 4.83).

Of the ephemeral maps Subarctic Indians produced for European explorers, several were notable for covering extremely large areas. In 1789, on the lower Mackenzie River, a Hare or Dogrib Indian who had been promised some beads drew for Alexander Mackenzie "upon the Land" a map apparently of what is now Yukon Territory and Alaska.²⁸⁴ Some three decades later, Indian guides, including a métis who had grown up with the Dogribs and Yellowknives, "drew a chart . . . on the floor with charcoal" for John Franklin "exhibiting a chain of

283. Ruggles, *Country So Interesting*, 193–255 and 266 (note 25). There is a substantial literature on these maps; in addition to Ruggles, see, for example, Judith Hudson Beattie, "Indian Maps in the Hudson's Bay Company Archives," *Association of Canadian Map Libraries Bulletin* 55 (1985): 19–31; idem, "Five Area Maps Recorded by Peter Fidler" (note 253); D. Wayne Moodie, "Indian Map-Making: Two Examples from the Fur Trade West," *Association of Canadian Map Libraries Bulletin* 55 (1985): 32–43; John Warkentin and Richard I. Ruggles, eds., *Manitoba Historical Atlas: A Selection of Facsimile Maps, Plans, and Sketches from 1612 to 1969* (Winnipeg: Historical and Scientific Society of Manitoba, 1970), 66–71, 86–105; and David H. Pentland, *Cree Maps from Moose Factory* (Regina: Privately printed preliminary edition, 1978), five pages and twenty photocopied manuscript maps.

284. W. Kaye Lamb, ed., *The Journals and Letters of Sir Alexander Mackenzie*, Hakluyt Society, extra ser., no. 41 (Cambridge: Cambridge University Press, 1970), 213.



FIG. 4.75. BITTEN PATTERNS ON BIRCHBARK, SOME INTERPRETED AS MAPS OF TRAILS. Lake St. John band of Montagnais, early twentieth century. These interpretations suggest an intuitive appreciation of "map" by the mainly female biter-interpreters. The figures from top to bottom are: trees and trails, trails, tents and connecting trail, and crossing trails.

Courtesy of the National Museum of the American Indian, Smithsonian Institution, New York (no. 19/5764–19/5767).

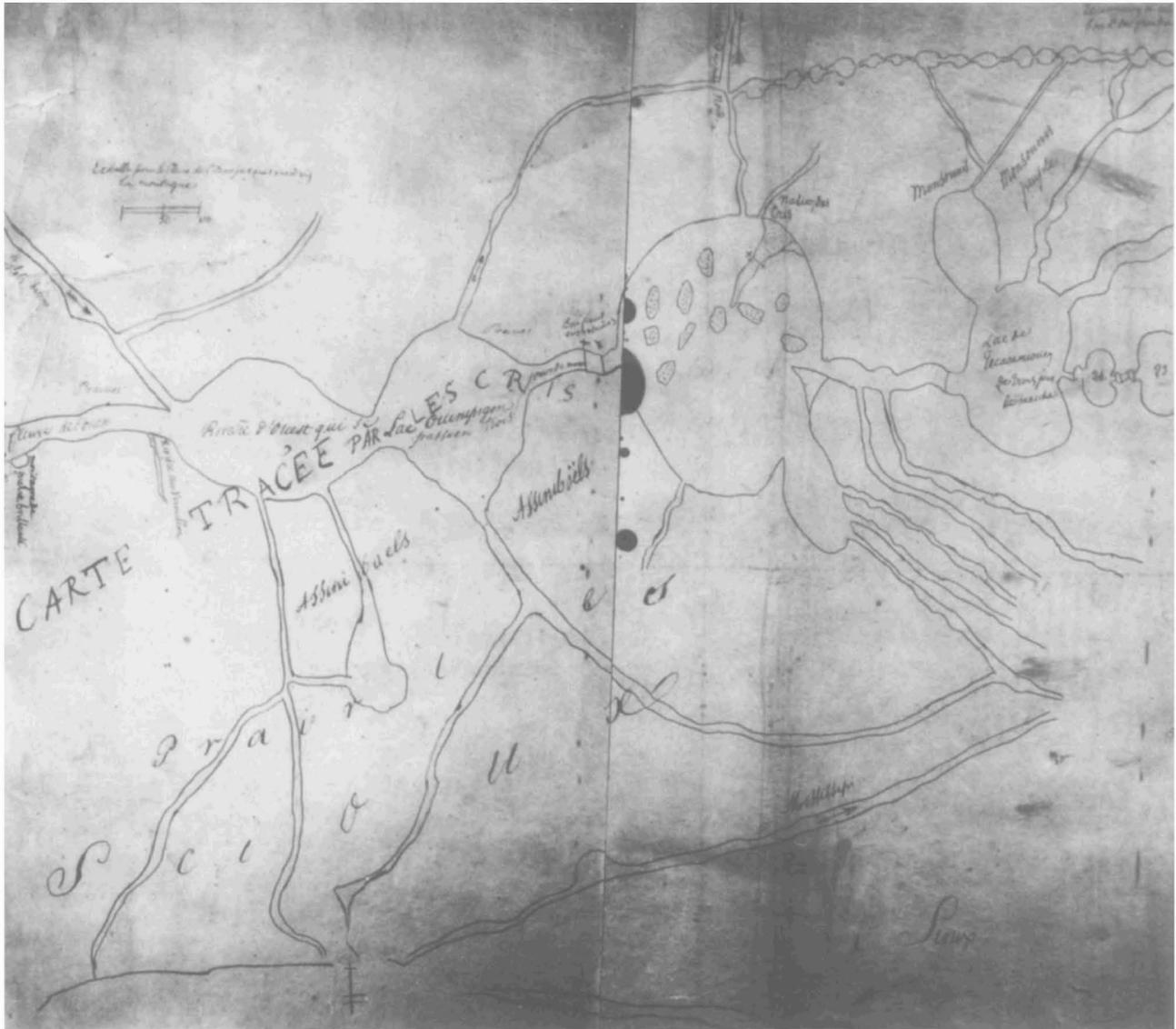


FIG. 4.76. MAP OF WHAT IS NOW MAINLY SOUTHERN MANITOBA BASED ON CREE MAPS. This is the left part of an untitled manuscript, ink on paper, almost certainly compiled in 1728 or 1729 by Pierre Gaultier de Varennes et de La Vérendrye. According to La Vérendrye's accompanying report, the map was derived from three Cree maps. This portion depicts Lake Winnipeg (Lac Ouinipigon), Lake of the Woods (large, unlabeled lake), Rainy Lake (Lac de Tecacamiouen),

and associated rivers and lakes, and it is generally referred to as "Carte Tracée par les Cris" after the bold inscription on the left. This is a photograph of what was probably the original. Size of the entire original: 25.5 × 73.5 cm. Photograph courtesy of the National Archives of Canada, Ottawa (NMC 24556). Original held in the Centre des Archives d'Outre-mer, Aix-en-Provence (Archives Nationales, France), E 199, dossier Gaultier de la Verendrye de Varenne (Pierre).

twenty-five small lakes extending towards the north."²⁸⁵ It covered the region to the east of that in the map made for Mackenzie, extending north from Great Slave Lake to Great Bear Lake and beyond to Coronation Gulf. Neither of the maps was copied, but together they probably represented more than one million square kilometers.

A map "chalkt out" on a dining room floor in London in 1742 or 1743 gave rise to one of the best-known mid-eighteenth-century printed maps of western and northern Canada. The map chalked by Joseph La France, son of a

French fur trader and an Ojibwa woman, was incorporated as a major component of Arthur Dobbs's "A New Map of Part of North America." The making of La France's map was an example of a procedure in which Europeans or Euro-Americans and natives interacted, questioning and modifying each other's information until a consensus was reached.²⁸⁶ The facility with which Indians

285. John Franklin, *Narrative of a Journey to the Shores of the Polar Sea*, 3d ed., 2 vols. (London: John Murray, 1824), 1:318–19.

286. Christian Brun, "Dobbs and the Passage," *Beaver*, outfit 289

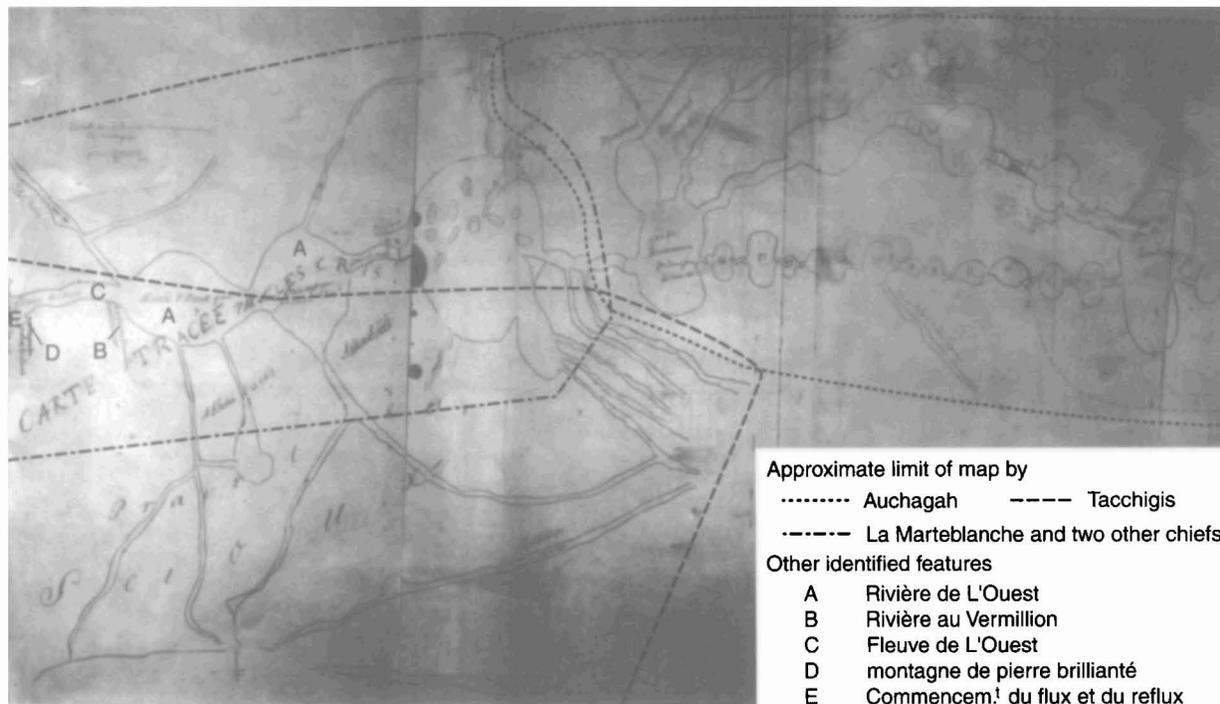


FIG. 4.77. INDIAN SOURCES FOR FIGURE 4.76. La Vérendrye's map was an integral part of his submitted report of 1729: "Continuation of the Report of the Sieur de La Vérendrye Touching upon the Discovery of the Western Sea." The report supplies information on the three Cree maps (made

by Auchagah, La Marteblanche and two other chiefs, and Tacchigis—none of these maps survive) that were the source of figure 4.76. Derived from evidence in his report, this illustration shows the probable native map sources for the left and central parts of La Verendrye's composite map.

extended Europeans' maps of rivers and coastlines beyond the limits of the latter's explorations suggests that the procedure may well have been used traditionally between different groups of Indians.

The contribution of Indian maps, most of which did not survive, to the compilation of European and Euro-American manuscript and printed maps can frequently be inferred from the stylized and simplified representations of lakes and rivers. For example, on many printed presurvey maps of the Canadian Shield, the complex, irregular hydrography is represented as straight sequences of small circular shapes, rather like beads on a lightly stretched necklace. Such patterns were characteristic of maps made by Inuit as well as Subarctic Indians, whose concern was not with distance, direction, or planimetric shape, but with river inflows, lake outflows, and sequences of features along frequently used water routes.²⁸⁷ Occasionally portions of Euro-American maps can be easily matched with corresponding native maps, but many more examples of native content incorporated on Euro-American maps doubtless remain to be demonstrated.

Features of particular importance to Indians and of characteristically Indian style persisted on maps made at the request of outsiders. Inconspicuous but culturally important features were often represented on maps that were relatively empty. Pierre Gaultier de Varennes et de

La Vérendrye's composite map of 1729, compiled from three Cree maps, is a good example (fig. 4.76; fig. 4.77 shows its Indian sources).²⁸⁸ Among the somewhat sparse details toward the left (approximately northwest and remotest from the French sphere) are a "Rivière au Vermillion" and a "montagne de pierre brillanté." The representation of the solitary river in a region of many rivers may have arisen from its importance as a source of onaman: colored sacred sand that was used as medicine. The "montagne de pierre brillanté" was a similarly exceptional feature, described by one of the Indian informants as "a small mountain, the stones of which sparkle night and day . . . the Dwelling of the Spirit, no one ventures to go near it." The Crees may well have been focusing on

(autumn 1958): 26–29, esp. 29, reproduces the account by Walter Bowman (a friend of Dobbs) of La France's drawing. The map was published in Arthur Dobbs's politically controversial work, *An Account of the Countries Adjoining to Hudson's Bay* (London: J. Robinson, 1744).

287. There are two good examples of such representations to the west of Lake Superior on "A Plan of Captain Carver's Travels in the interior Parts of North America in 1766 and 1767," almost certainly incorporating Indian information, first published in Jonathan Carver, *Travels through the Interior Parts of North-America, in the Years 1766, 1767, and 1768* (London, 1778).

288. Lewis, "Misinterpretation of Amerindian Information," and idem, "La Grande Rivière" (both note 2), discuss this map, its sources, and its influence.

these features in response to La Vérendrye's inquiries about placer gold and mountains far to the west.²⁸⁹ Their responses, however, were with reference to small features endowed with cultural importance.

The reasons for the representation of specialized features on maps drawn by Subarctic Indians is not always immediately apparent. For example, the 150-kilometer limestone escarpment ("same ridge as Limestone Rapid–Nelson River & Big Fall Churchill River—a large hill [Big Fall]") and two old beach lines of Hudson Bay ("a ridge of Gravel & a hill of Wood") are clearly represented on an otherwise fairly empty early nineteenth-century Cree map of what is now northeastern Manitoba (fig. 4.78). A possible explanation is that they were land routes across what was undoubtedly difficult terrain; but in that case, why weren't they indicated as paths or trails?

The reason for including a similar feature on a more detailed map drawn of the same area in 1894 is more obvious. Two Chipewyans, Jimmy Anderson and Curly Head, represented sand ridges to the north of the lower Churchill River; these were almost certainly some of the eskers and kames deposited during the last (Wisconsin) glaciation (fig. 4.79). Since the map was made for the geologist J. B. Tyrrell, for whom the geologic features would have been of particular interest, he may have asked that they be noted on the map. The Chipewyans also delineated the "Edge of Woods" for Tyrrell on the 1894 map, marking with a dashed line the boundary between the spruce-and-fir forests in what are now northern Manitoba and Saskatchewan and the tundra with occasional patches of trees and shrubs farther north, distinctively different but equally familiar environments. Indeed, in drawing the "Edge" they were following in a long Chipewyan tradition represented in composite by figure 4.80. The earliest evidence is on three contemporary transcripts of mid-eighteenth-century maps (fig. 4.81 and 4.83; fig. 4.71 above). Seen together and interpreted in the contexts in which they were made, it is clear that the Chipewyan mapmakers were keenly aware of the two ecologically different worlds.

Meatonabee, one of the Indians who drew the original of the map illustrated in figure 4.81, led Samuel Hearne on his third and successful attempt to reach the sources of low-grade copper in the valley of the lower Coppermine River. Hearne reported the strategic significance that Meatonabee consciously gave to the "woods edge" in planning the route to be followed and in scheduling the various stages of the proposed journey in relation to seasonal conditions. Hearne's manuscript map of 1772, which had been compiled in part on a "Strict enquiry of the natives," clearly depicted "The Woods Edge" by means of a dotted line ornamented at regular intervals by a coniferous-tree symbol.²⁹⁰ Undoubtedly Meatonabee was one of Hearne's informants concerning this fea-

ture, which is approximately two thousand kilometers long. Figure 4.81 shows, between the Coppermine River and Fort Churchill, "The leaders track in coming to ye fort," but there is no other line that could be inferred to generalize the tundra-forest transition zone. In two places, however, the absence of woods is indicated near the coast, and the largest, but not boldest, word on the map is "Woods" in pencil, well inland close to the marked track.²⁹¹

This transcript of Meatonabee and Idotlyzee's map, probably made by Moses Norton, uses a scalloped line to show the boundary between the Back Lowlands–Thelon Plain and the uplands and mountains of the shield proper, extending through the interior from the head of Chesterfield Inlet almost to the mouth of the Coppermine River. On the same map, five short segments of the same pattern represent the bolder Bathurst Hills: the "Stoney Mountains." The scalloped line was a simplified version of the hill-in-profile pictograph commonly used by North American Indians to represent mountains (see fig. 4.82).

A remarkable feature of two eighteenth-century maps by Subarctic Indians, which is also found on two Inuit maps (see below, figs. 4.94 and 4.95), is the extraordinary generalization of up to four thousand kilometers of the continental coastline of what are now the Canadian Northwest Territories. The coastline is represented as essentially straight although it has two enormous peninsulas (Melville and Boothia) and one major change in over-

289. Lewis, "La Grande Rivière," 72–78; the description by the Indian informant can be found in Pierre Gaultier de Varennes de La Vérendrye, *Journals and Letters of Pierre Gaultier de Varennes de La Vérendrye and His Sons*, ed. Lawrence J. Burpee (Toronto: Champlain Society, 1927), 58.

290. "A Map of part of the Inland County to the N^h W^t of PRINCE of WALE'S Fort H^s; B^y, Humbly Inscribed to the Gov^r Dep^y, Gov^r and Committee of the Hon^{ble}, Hud^{ts}, B^y Comp^y By their Hon^{ts}, moste obedient humble servant. Sam,^l Hearne; 1772." Manuscript, ink on paper, 76.7 × 82.5 cm, Hudson's Bay Company Archives, Winnipeg (G2/10); for an illustration, see Ruggles, *Country So Interesting*, pl. 9 (note 25).

291. For more on this map see June Helm, "Matonabee's Map," *Arctic Anthropology* 26, no. 2 (1989): 28–47. A recent study of the positional response of the wood's edge to climatic changes drew on the evidence of dendrochronology and historical records. Reproducing a transcript of figure 4.83, it concluded that "cardinal directions are not represented realistically, however, making the map unreliable for our purposes" (p. 189). In contrast, "the maps of Samuel Hearne" were considered to "have much greater fidelity to cardinal directions and the shapes of rivers and lakes" (pp. 189–90). Although recognizing that "the routes taken by Hearne indicate that he could not actually have seen all the features depicted on his general map [footnote 290] and must have relied upon accounts from his native guides" (p. 190), the authors seem unaware that very little of the wood's edge could have been surveyed or that information about its position must have been obtained from Meatonabee and Idotlyzee. With greater awareness they might not have concluded that "Hearne's map of the woods edge is particularly important" as evidence. Glen M. MacDonald et al., "Response of the Central Canadian Treeline to Recent Climatic Changes," *Annals of the Association of American Geographers* 88 (1998): 183–208.

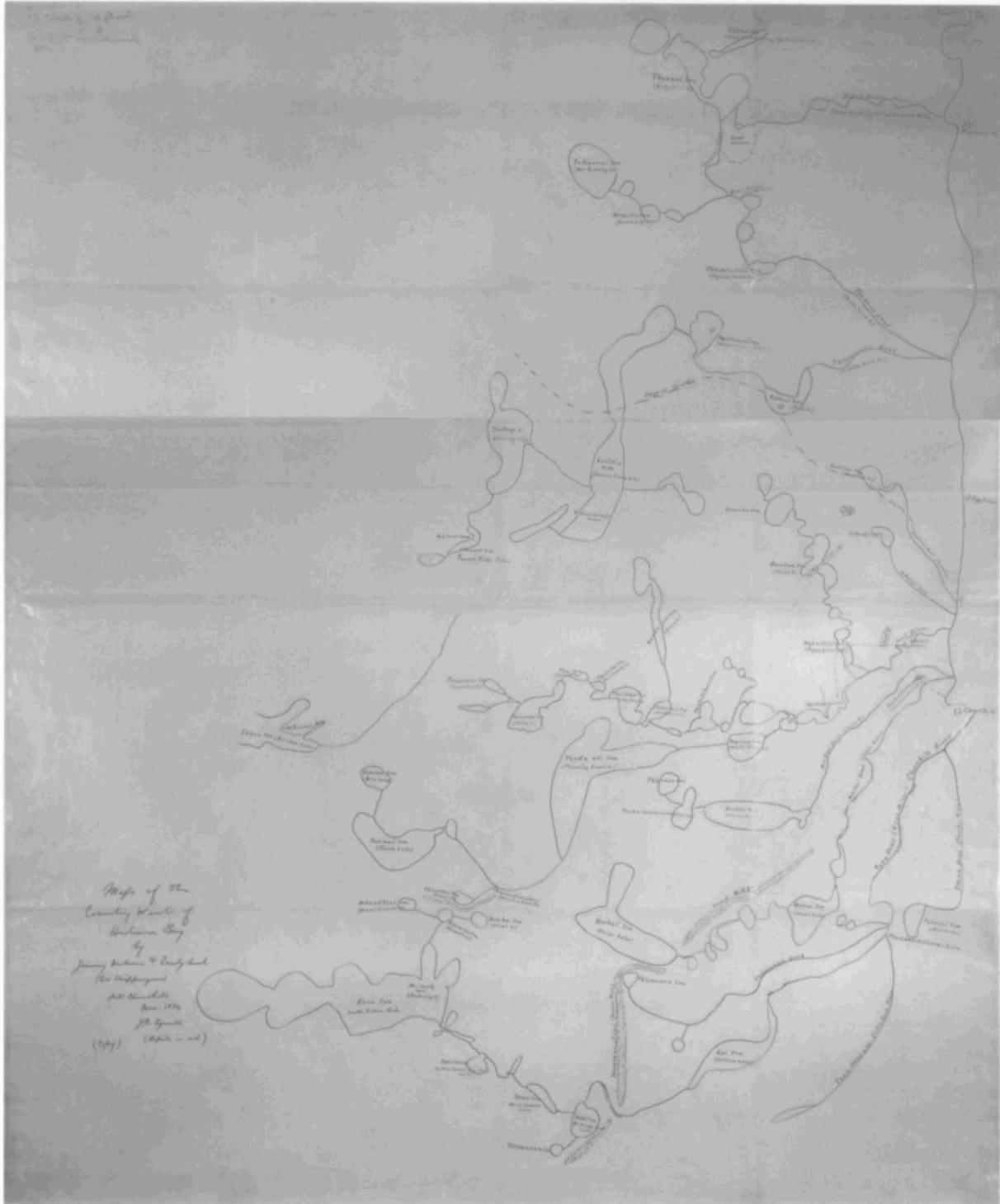


FIG. 4.79. JIMMY ANDERSON AND CURLY HEAD'S MAP OF THE LAKES AND RIVERS WEST OF HUDSON BAY. Manuscript copy in ink on paper, 1894. The inscription reads: "Map of the Country West of Hudson Bay by Jimmy Anderson & Curly head (two Chippewyans) Fort Churchill Nov. 1894, J. B. Tyrrell (Rapids in red) (Copy)." Thematic content includes dashed line, "Edge of Woods"; a fine dashed line, "Large Timber" (exclave of coniferous forest on the tundra); "Sand Ridge"; and English translations of Indian topo-

nyms, some incorporating thematic information, e.g., "Boggy Ground L." and "Gravel Ridge Lake." What may be an earlier version of this map is in the same collection in four sheets, and on it the pencil lines could well be the Chipewyans' originals; it does not, however, reproduce well. Size of the original: 95 × 76.5 cm. Photograph courtesy of the J. B. Tyrrell Papers, Thomas Fisher Rare Book Library, University of Toronto (1894.016).

all direction. The earlier of the two maps, compiled by James Knight when he was governor of the Hudson's Bay Company's territories, was based in large part on Cree and Chipewyan maps made for him before his death in 1719 or 1720 (fig. 4.83). It represents the coastline from Fort Churchill to the mouth of the Coppermine River as almost a straight line, with a slight change in direction at Repulse Bay, where in reality one does not exist. Knight used two or more Indian maps as sources, and lacking a clear understanding of the coast as a whole, he may have misunderstood their orientation and joined the components in a way that did not represent Indian understanding of the coast.

There is no such explanation for the 1767 map by Meatonabee and Idotlyazee, on which the same coastline is represented as even straighter than on Knight's map. Chipewyans were frequent visitors to Churchill Factory, where the map was copied and supplemented by Moses Norton, and they also knew the interior very well, as shown by Meatonabee's successfully guiding Samuel Hearne's expedition to the Coppermine River. They may not, however, have had knowledge of the coastal region north of Churchill Factory. That was entirely within the Inuit culture region, where languages and way of life were different from those of the Athapaskan-speaking Indians of the interior. As late as 1892, annotations on a contemporary transcript of a canoe-route map made for Tyrrell by a Chipewyan named Andrew, which ended at the middle Great Indian (Thelon) River, noted that the route was "known only to the Eskimos" (fig. 4.84). Yet Meatonabee and Idotlyazee's map, in addition to representing the rivers and lakes of the interior, does indicate their lower courses to the sea with reasonable felicity.

Andrew's map represents a highly complex route, almost one thousand kilometers long, across portages, and through scores of complexly shaped lakes from Lake Athabasca northeast to the Thelon River in what is now the Northwest Territories. It was made to indicate that a passable route existed, was known to the informant, and linked the place at which it was made to a major feature (Hudson Bay) that Tyrrell wished to reach. It is doubtful whether the map would have been of any use to an uninitiated guide. Tortuous river courses are smoothed out, and complex lake shorelines are either symbolized by circles and ovals or caricatured to emphasize critical bays and peninsulas. The spacing of features along the route is certainly not planimetric and probably not even according to travel time. None of the innumerable potentially false routes are represented.

Unlike most canoe-route maps, Andrew's does not represent rapids or falls. Yet such features were common on maps made by Subarctic Indians, always represented by one or more short strokes transverse to the line of the river channel. The enhanced map on animal parchment

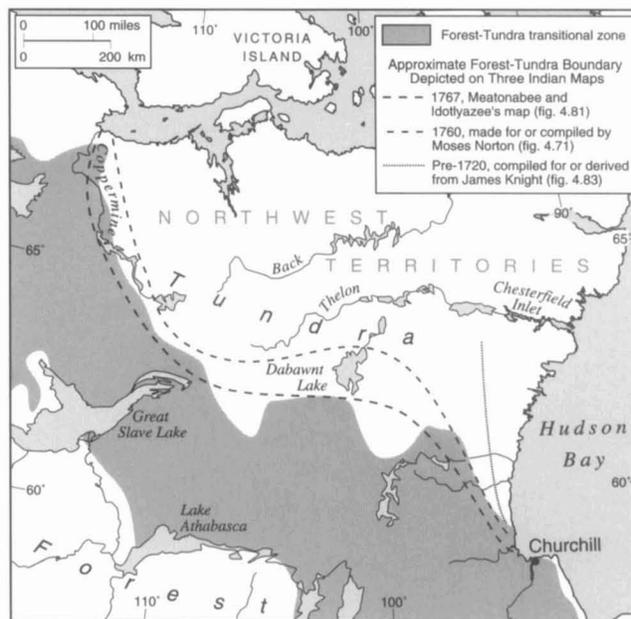
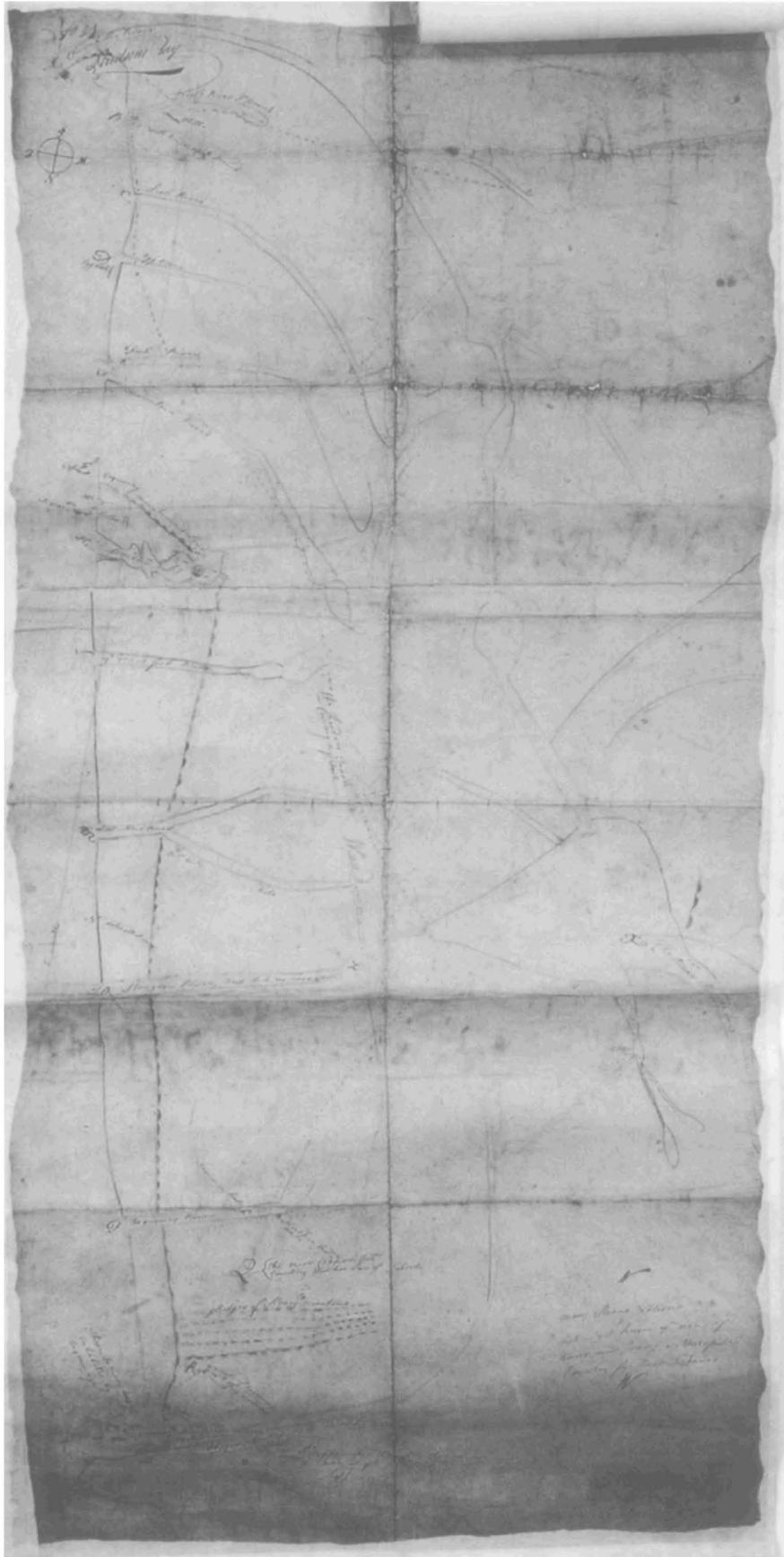


FIG. 4.80. FOREST-TUNDRA BOUNDARIES FROM INDIAN MAPS OF THE NORTHERN INTERIOR. This map shows boundaries from the untitled map of an extensive area west and northwest of Hudson Bay (fig. 4.83); "Moses Norton's Drt" (fig. 4.71); and Meatonabee and Idotlyazee's "Explanation of a Draught" (fig. 4.81). These three maps were the sources of dashed lines pre-1720, 1760, and 1767, respectively, on this figure.

of the area west of Hudson Bay about 1760 is a good example (fig. 4.71).

Although Indian characteristics persisted in maps made for Euro-Americans, the maps were necessarily also influenced by factors introduced by Euro-Americans. The media supplied for making maps influenced their appearance. A map of Lake Nipigon made at Fort William in 1869 by Ojibwas (Indians of the Northeastern region but having much in common with the Northern Ojibwas, their Subarctic neighbors immediately to the north) for the geologist Robert Bell is a good example of media proportions' influencing overall map shape (fig. 4.85). The map was drawn by Windigo, assisted by other Indians from Lake Nipigon, at Bell's request and on a sheet of paper he supplied. If the sheet had been oriented with the long axis vertical the map probably would have been shaped much closer to planimetry (fig. 4.86). Bell's account of the procedure suggests a casual response to his request.

I gave one of them [Windigo] a sheet of paper, which he spread upon the cook's baking board and went to work with a lead pencil to make a sketch of the lake [Nipigon]; all the rest standing round him in a circle helping him by their suggestions and improvements. While this interesting work and discussions were going on, some one (in an evil moment) knowing their



(Facing page)

FIG. 4.81. MEATONABEE AND IDOTLYAZEE'S MAP OF AN EXTENSIVE AREA OF MAINLAND CANADA NORTHWEST OF HUDSON BAY. Chipewyan, 1767. Transcript on paper (probably by Moses Norton) of original on deerskin, pencil enhanced in ink; endorsement: "An Explanation of a Draught brought by two Northern Indian Leaders Call'd Meatonabee & Idotlyazee, Of Y^e Northward of Churchill River Viz' Hudsons Bay." Geometrically, at least, this seems to be an exact copy of the original skin. Size of the original: 144.8 × 71.8 cm. Photograph courtesy of the Hudson's Bay Company Archives, Provincial Archives of Manitoba, Winnipeg (G2/27).

weakness—tossed them a pack of cards. In an instant, baking board, paper and pencil were dropped and games commenced, at which they played with great eagerness all afternoon. . . . I afterwards got the map finished and here is the result of their combined effort, only touched up with a little color. I should mention that the shape is distorted Indian fashion to fit the paper and to make the most of it.²⁹²

Other shapes on Windigo's map were probably not the consequence of paper size and proportion. Two bays on the left (approximately west) of Lake Nipigon are represented as disproportionately large and indented. Grand Bay and Gull Bay were on the part of the coast on which the Ojibwas had been granted small reserves by the terms of the Robinson-Superior Treaty of 1850. On Windigo's map these two bays and the intervening stretch of coast constitute approximately 30 percent of the lake's total shoreline; in reality, they make up approximately 10 percent. This exaggeration was most probably a consequence of long-standing tradition in showing the Gull Bay area: the bay had long been the most important point of entry into the lake by Indians in their small birchbark canoes, and the Gull River was the route used to and from Fort William on Lake Superior.²⁹³ Significantly, the Gull River is represented wide and bold on Windigo's map.

Scientific surveys also fostered and influenced Indian mapping in the Far North. In 1838 a Cree had suggested to the Hudson's Bay Company's trader, Robert Miles, at Fort Rupert that Charlton Island at the south end of James Bay would make a good beaver preserve. It was unsettled, virtually unknown, and without both beavers and most of their mainland predators (it did have otters, which could destroy the beavers). In the winter of 1838–39 two Crees were ordered to map the island and trap otters. They produced a chart in pencil containing "sixty

292. "Lecture on 'Exploration in the Nipigon Country' by R. Bell, Delivered under the Auspices of the Nat. Hist. Socy. of Montreal, Feby. 10th 1870. Being the First of the Sommerville Course," manuscript, Robert Bell Collection, National Archives of Canada, Ottawa (MG 29 B 15, vol. 36).

293. *Historical Atlas of Canada*, vol. 1, pl. 63 ("Transportation in the Petit Nord," by Victor P. Lytwyn) (note 71).

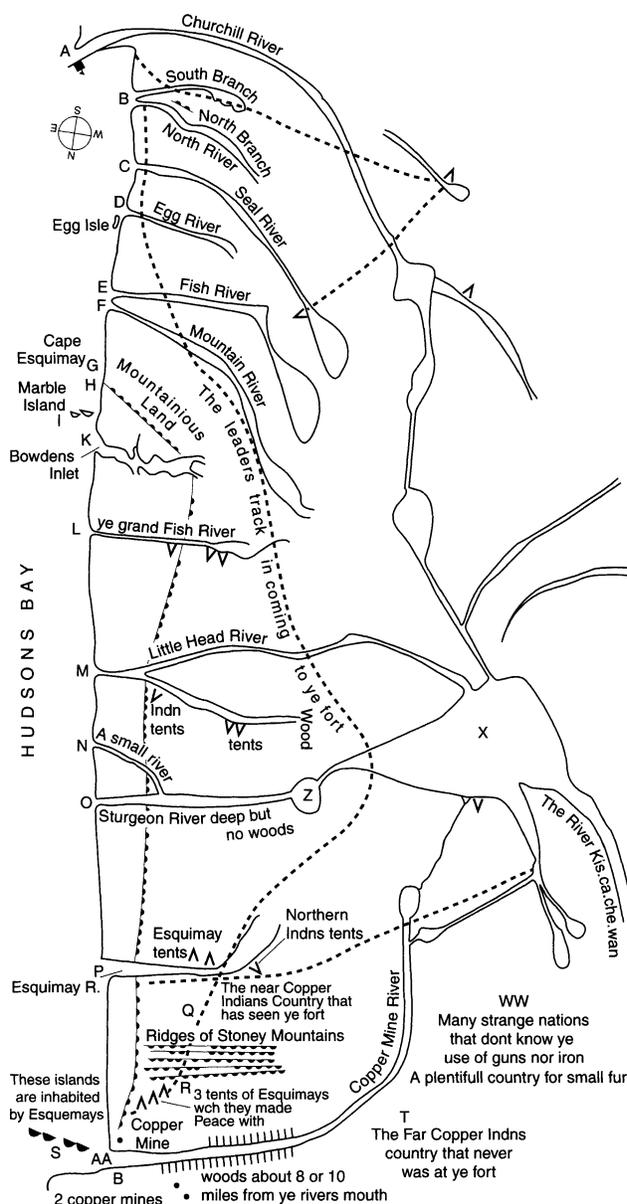
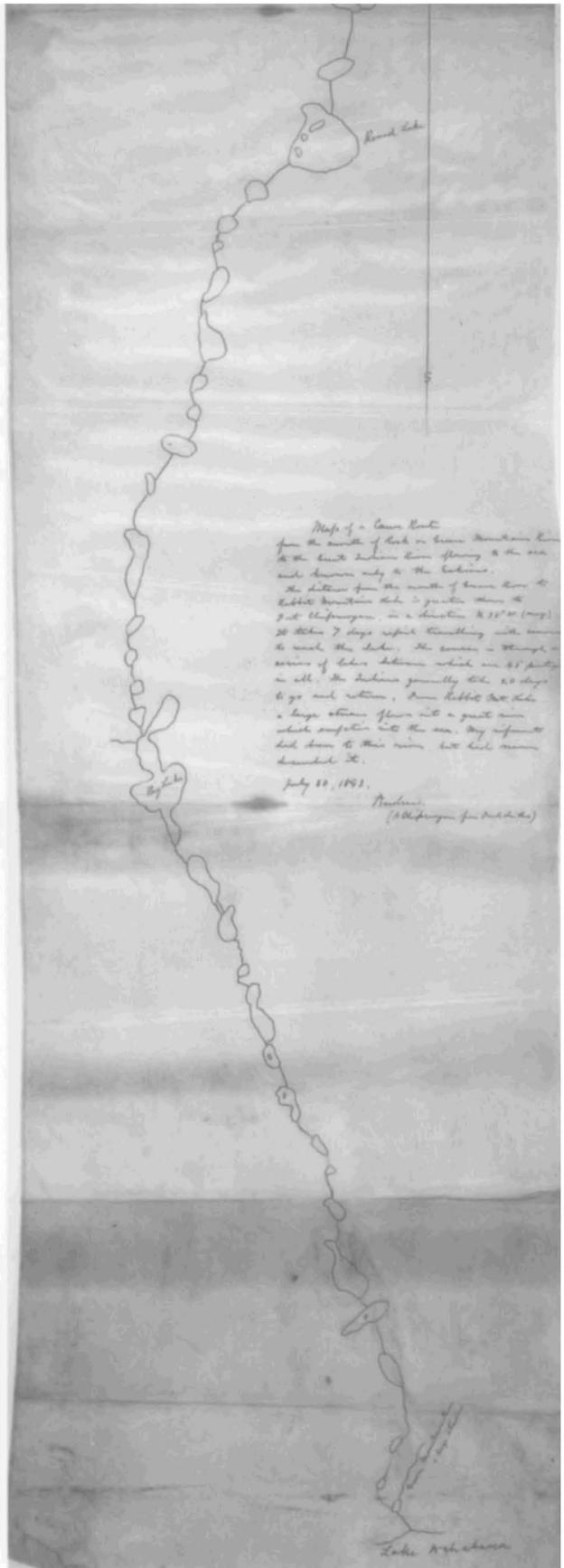
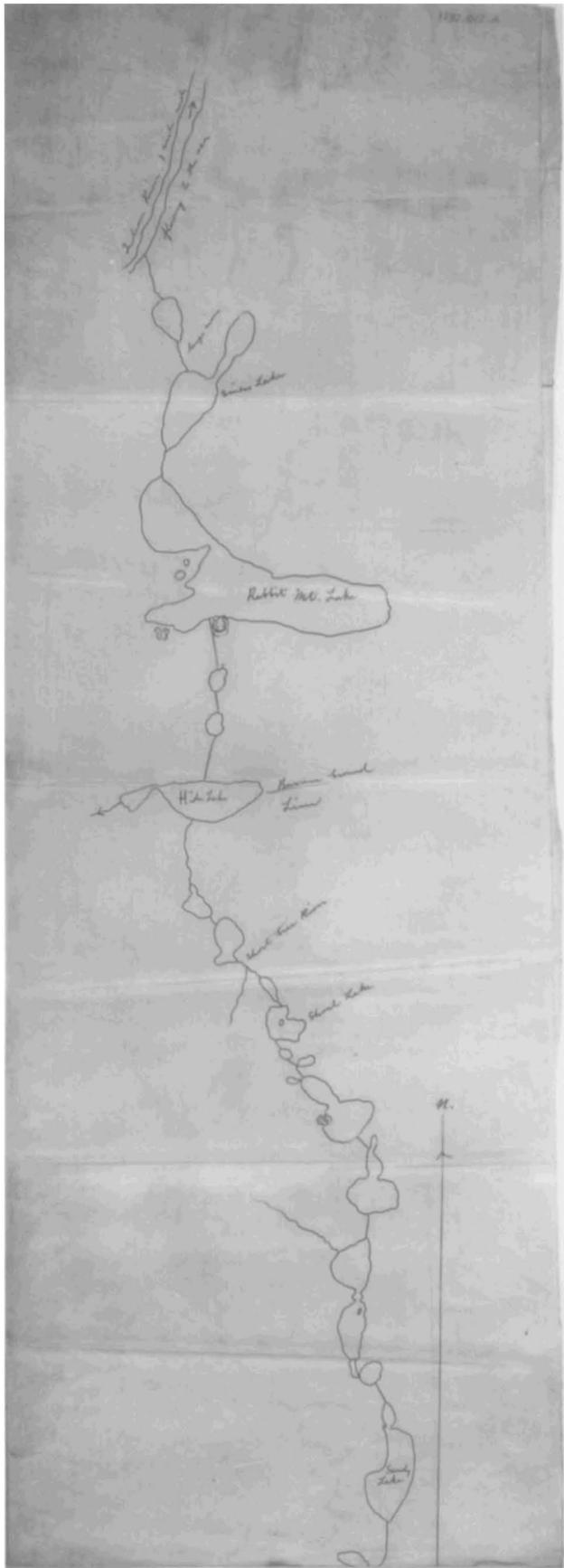


FIG. 4.82. REDRAWING OF MEATONABEE AND IDOTLYAZEE'S MAP (FIG. 4.81). After John Warkentin and Richard I. Ruggles, eds., *Manitoba Historical Atlas: A Selection of Facsimile Maps, Plans, and Sketches from 1612 to 1969* (Winnipeg: Historical and Scientific Society of Manitoba, 1970), 91.

one Lakes laid down by them, they consider eligible and desirable in every respect for Beaver to inhabit but they say there are many more other smaller Lakes they did not note, but which nevertheless if Beaver were numerous on the Island they would with their customary sagacity render inhabitable by their dams."²⁹⁴ In the spring of 1839

294. "Rupert House Journals, 1838–39," Hudson's Bay Company Archives, Winnipeg, B186/a/58, p. 33, 16 and 20 April 1839. The original chart is lost, but a copy of 1839 is extant: "Copy.—Survey of Charl-



Map of a Lake Route
 from the mouth of Lake Ashokan to the sea
 and thence to the lakes
 The distance from the mouth of Lake Ashokan to
 Rabbit Mountain Lake is greater than to
 St. Lawrence in a direction N 50° W (1887)
 It takes 7 days up to the mouth of the lake
 to reach the lake, the course is through
 series of lakes between which are 45° points
 in all the lakes generally it is 20 days
 to go and return, from Rabbit 200 Lake
 a large stream flows into a great river
 which empties into the sea, they suppose
 had been to this river but had never
 descended it.

July 20, 1887.
 (A. S. Peckham)



FIG. 4.85. CHIEF WINDIGO'S MAP OF LAKE NIPIGON, ONTARIO. Nipigon band of Ojibwas, ca. 1869, probably original Indian pencilwork on paper, enhanced in ink and blue wash, and with the addition of many names. Windigo was be-

ing assisted and interactively corrected by other Indians. Size of the original: 53 × 65.5 cm. Photograph courtesy of the Robert Bell Collection, National Archives of Canada, Ottawa (NMC 21734).

pieces of white mica got from the band of coarse white pegmatite in the surrounding vicinity. . . . He also drew a map of the country from John Scotts Lake to Wikusko Lake, including the latter lake."²⁹⁸

ARCTIC

The Inuit of the Arctic have sometimes been singled out as particularly able mapmakers.²⁹⁹ Such opinions, which

298. Joseph B. Tyrrell's field notebook #1950, entry for 13 July made on Indian Reserve Island, p. 30, National Archives of Canada, Ottawa, RG 45, vol. 174.

299. Robert A. Rundstrom, "A Cultural Interpretation of Inuit Map Accuracy," *Geographical Review* 80 (1990): 155–68, esp. 157. It was certainly not the case that Inuit were "perhaps alone in attempting the delineation of relief features"; Leo Bagrow, *History of Cartography*, rev.

and enl. R. A. Skelton, trans. D. L. Paisley (Cambridge: Harvard University Press; London: C. A. Watts, 1964; reprinted and enl., Chicago: Precedent, 1985), 27.

In a more recent article, Rundstrom looks at the exchange of maps and geographic information between Inuit and Europeans and Euro-Americans in the nineteenth and early twentieth centuries and asks why the Inuit were such remarkable mapmakers and eager to provide maps when there was no obvious cultural basis for map production. He concludes that "Inuit maps are best considered as *acts*, not artifacts," with the primacy of the making over the object. "Mimetic performances influenced virtually every aspect of Inuit life, and mapmaking should not be considered as any different in this respect." See Robert A. Rundstrom, "Expectations and Motives in the Exchange of Maps and Geographical Information among Inuit and *Qallunaat* in the Nineteenth and Twentieth Centuries," in *Transferts culturels et métissages Amérique/Europe, XVI^e–XX^e siècle*, ed. Laurier Turgeon, Denys Delâge, and Réal Ouellet (Sainte-Foy, Quebec: Presses de l'Université Laval, 1996), 377–95, esp. 387–88.

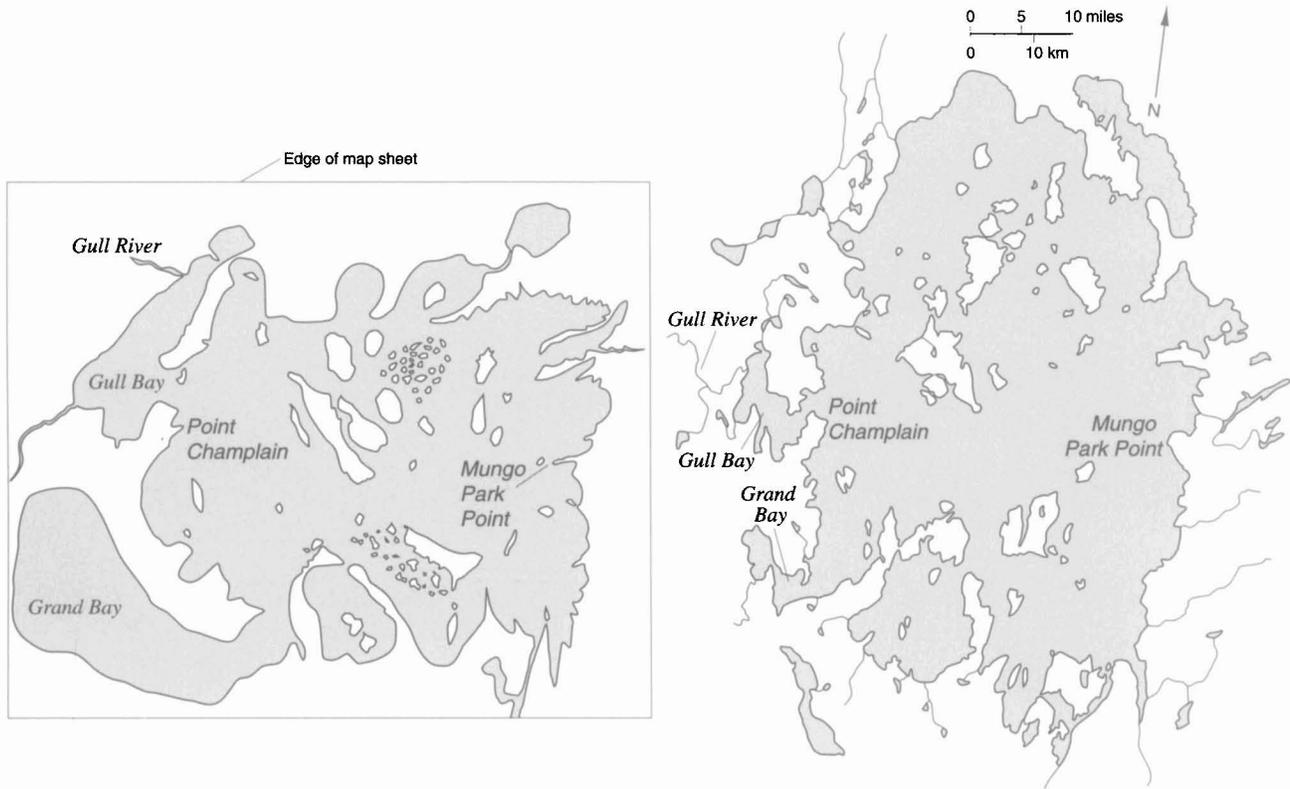


FIG. 4.86. THE LINEWORK ON WINDIGO'S MAP OF LAKE NIPIGON RELATED TO THAT ON A MODERN MAP. Windigo's outline is on the left; on the right is a modern

outline. This highlights the influence of paper proportions on the overall shape of Windigo's map.

have been stronger outside than within North America, probably arose from a combination of three general circumstances: the relatively late but well-recorded contact between Inuit and Euro-Americans; the reproduction of redrafted versions of Inuit maps in several widely read nineteenth-century works on Arctic exploration;³⁰⁰ and the systematic collection of information in map form on later scientific expeditions, many examples of which were featured in subsequent published reports.³⁰¹ One recent work selects an Inuit example to illustrate graphically the "ability of indigenous peoples to draw accurate maps." A map of the Belcher Islands given to Robert Flaherty in 1910 by Wetalltok is reproduced adjacent to one earlier and one later printed chart of that part of Hudson Bay.³⁰² The number, shapes, and pattern of islands on the Inuit's map are quite unlike those on the earlier chart but are remarkably similar to those on the later map. When Inuit planimetry has differed markedly from that on Euro-American maps, the assumption has been that it was a

Search of Survivors of Sir John Franklin's Expedition (London: Sampson Low, Son, and Marston, 1865), 105 and 537.

301. For example, Franz Boas, "The Central Eskimo," in *Sixth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1884-'85* (Washington, D.C.: United States Government Printing Office, 1888), 409–669, esp. 643–47 (pl. IV and figs. 543–46); Knud J. V. Rasmussen, *Iglulik and Caribou Eskimo Texts*, Report of the Fifth Thule Expedition 1921–24, vol. 7, no. 3 (Copenhagen: Glydendalske Boghandel, 1930), 89–99 and 146–60 (sketch maps I–XI); idem, *The Netsilik Eskimos: Social Life and Spiritual Culture*, Report of the Fifth Thule Expedition 1921–24, vol. 8, nos. 1 and 2 (Copenhagen: Glydendalske Boghandel, 1931), 91–113 (sketch maps I–VIII) and 477–80 (sketch maps I and II); idem, *Intellectual Culture of the Copper Eskimo*, Report of the Fifth Thule Expedition 1921–24, vol. 9 (Copenhagen: Glydendalske Boghandel, 1932), 86–89 (sketch maps I and II); Therkel Mathiassen, *Material Culture of the Iglulik Eskimos*, Report of the Fifth Thule Expedition 1921–24, vol. 6, no. 1 (Copenhagen: Glydendalske Boghandel, 1928), 98 (fig. 58); idem, *Contributions to the Physiography of Southampton Island*, Report of the Fifth Thule Expedition 1921–24, vol. 1, no. 2 (Copenhagen: Glydendalske Boghandel, 1931), 11–12 (figs. 1 and 2); idem, *Contributions to the Geography of Baffin Land and Melville Peninsula*, Report of the Fifth Thule Expedition 1921–24, vol. 1, no. 3 (Copenhagen: Glydendalske Boghandel, 1933), pl. 2; and George Miksch Sutton, "The Exploration of Southampton Island, Hudson Bay," *Memoirs of the Carnegie Museum* 12, pt. 1 (1932): esp. 45 and 46 (figs. 1 and 2).

302. David Turnbull, *Maps Are Territories, Science Is an Atlas: A Portfolio of Exhibits* (Geelong, Victoria: Deakin University, 1989; reprinted Chicago: University of Chicago Press, 1993), 24–25 (figs. 4.9–4.11).

300. For example, William Edward Parry, *Journal of a Second Voyage for the Discovery of a North-west Passage from the Atlantic to the Pacific* (London: John Murray, 1824), facing 197, 198, and 252; John Ross, *Narrative of a Second Voyage in Search of a North-west Passage*, 2 vols. (London: A. W. Webster, 1835), facing 1:262; and Charles Francis Hall, *Life with the Esquimaux: A Narrative of Arctic Experience in*

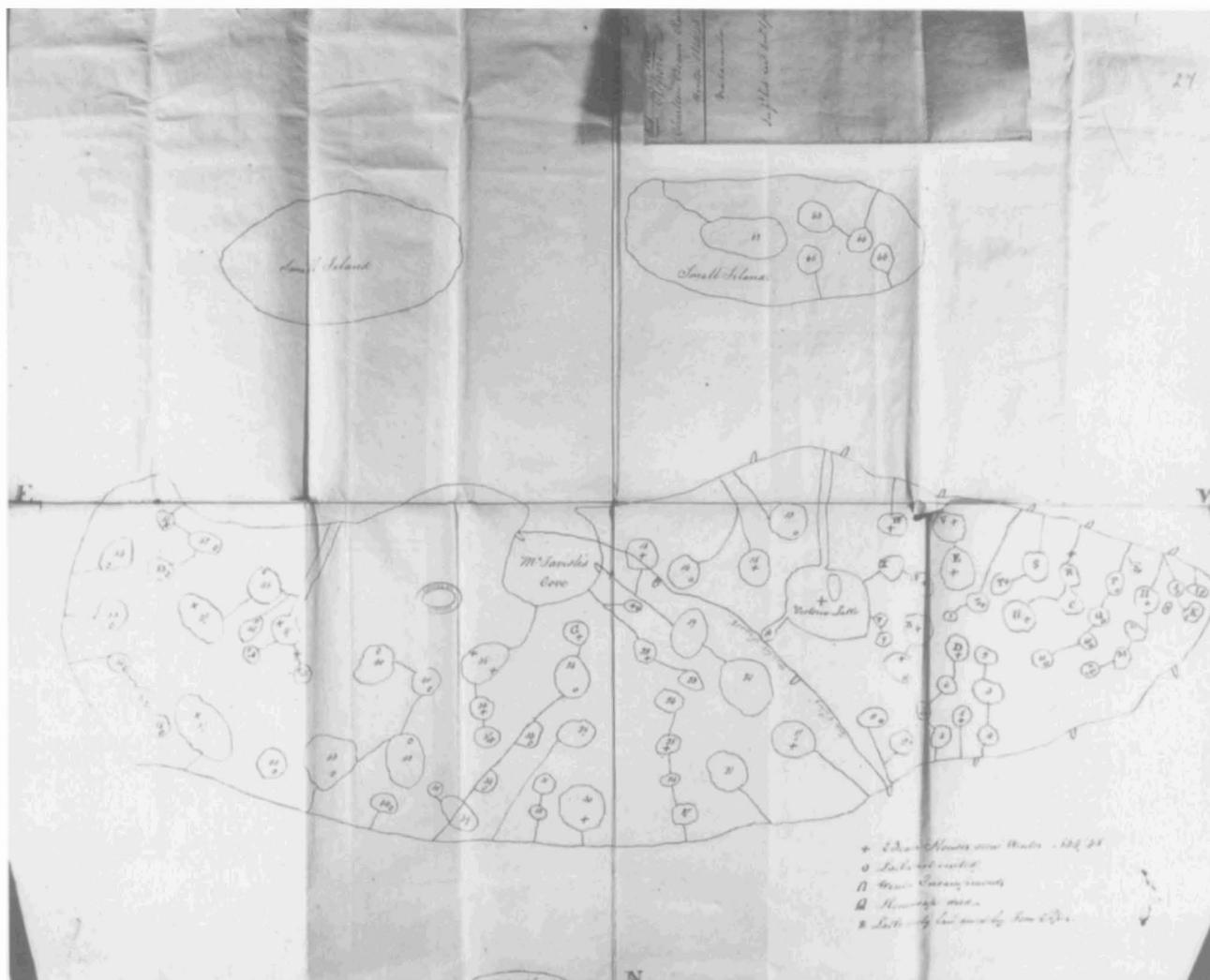


FIG. 4.87. TOM PIPES'S INDEX MAP FOR HIS SURVEY OF CHARLTON ISLAND DURING ITS SIXTH WINTER AS A BEAVER PRESERVE. Probably Cree, 1845, ink on paper. "Sketch map to illustrate reports on Charlton Beaver Preserve by the Indian Tom Pipes." Eight maps related to the beaver preserve were made between 1839 and 1846.

Size of the original: 53.6 × 66.3 cm. Photograph courtesy of the Hudson's Bay Company Archives, Provincial Archives of Manitoba, Winnipeg (B186/b/49, fol. 27).

consequence of poor drawing skills, incomplete spatial knowledge, or both. This may have been true in some cases, but differences also arose from Inuit's blending geographic knowledge with cosmographic tradition. Evaluating the accuracy of Inuit maps according to planimetry must therefore be undertaken with these caveats in mind.

Spink and Moodie, in an early review of Inuit maps and accounts of mapping activities in the Canadian Eastern Arctic, concluded that the

maps communicate only part of the territorial knowledge of the Inuit. They are simple and unadorned drawings which seek to represent sufficiently memorable features of landscape as to make a route navigable by one who has never journeyed that way before. The maps possess unique characteristics of

scale, content, and style, and were executed upon distinctive media prior to the coming of the Europeans. Although deficient as pleasing charts, they serve as practical accompaniments to an extremely colourful and diverting verbal account. The stories implicit in most of the place-names and the appropriate naming of landforms in Arctic territory reveal the maps to be merely part of the process of communicating territorial knowledge.

The maps are generally limited to portraying areas which were visited by the draughtsman, but such a restriction does not impose a severe handicap on the amount of territory which can be represented. . . . The widespread use of mapping among the Eskimo reflects not only their territorial knowledge, but also the frequency of travelling. Their great mobility in part ex-

plains why they are prepared to accept cartography when more sedentary peoples are not prepared for its inherent quick diminishing of distance. Cartography is apparently an indigenous element of Eskimo culture, and perhaps even an essential adjunct to the nomadic way of life.³⁰³

Spink and Moodie did not, however, account for the variation in proficiency observable in Euro-American accounts.

EURO-AMERICAN PERCEPTIONS

Assertions about the mapmaking skills of Arctic natives were often put forth as unsupported generalizations. For example, in or before 1849 Teben'kov wrote, "The ability of the Aleuts to compile sketches of their habitat is noteworthy. I had many sketches made by them which are very similar to geodesic surveys."³⁰⁴ Similarly, the French naval officer Joseph René Bellot, on his first day in the Arctic, commented that an Iglulik's sketch of the location of two ships along the coastline of Baffin Island "once more attested [to] their singular geographical aptitude."³⁰⁵ That he reached such a conclusion so quickly may indicate preconceived ideas about the mapping aptitude of Inuit.

As we might expect, most Inuit maps represent coastlines, the critical zones between land and marine resource worlds. Unlike maps of large areas of terra incognita, coastal maps could be evaluated soon after they were made, when the coastline was explored and provisionally surveyed. In 1851, a group of Kangarjuatjarmiut men and women drew a coastline map for the crew of the *Investigator*, "the accuracy of which was subsequently fully confirmed by the journey of Mr. Rae along the coast."³⁰⁶

On other occasions, however, subsequent Euro-American experience seemed to expose the limitations of Inuit maps. In 1853, on the east coast of Victoria Island, Captain Richard Collinson reported that one of his crew "succeeded in inducing some of them [possibly of the Equalugtormiut group of Copper Eskimos] to draw a chart of the coast to the eastward, which was several times repeated, agreeing very well with each other, but were totally unlike the coast afterwards travelled over by me."³⁰⁷ William Edward Parry, commenting on a number of charts of the coast of Melville Peninsula made by Iglulik Eskimos in 1822, observed that "no two charts much resembled each other, and that the greater number of them still less resembled the truth in those parts of the coast with which we were well acquainted."³⁰⁸

One direct comparison of an Inuit map with a contemporary Admiralty map of the coast from the nineteenth century exists (fig. 4.88). It is of approximately eight hundred kilometers of the north coast of Alaska, from Point Barrow to perhaps Herschel Island. Of the

original by the shaman Erk-sin'-ra, John Simpson, surgeon on HMS *Plover* and author of the first substantive account of the North Alaska coast natives, wrote that it agreed "minutely in many particulars with the narrative and chart of Messrs. Dease and Simpson," except that Erk-sin'-ra denied the existence of the Pelly Mountains to the west of the Colville River. The shaman conceded, "We never saw them, but perhaps you might with your long spy-glasses."³⁰⁹ Indeed, the Pelly Mountains reported by Thomas Simpson did not exist.³¹⁰

A map made in 1823 by another shaman, Toolemak, was evaluated less favorably. Parry reported that "Toolemak, though a sensible and intelligent man, we soon found to be no draftsman, so that his performance in this way, if taken alone, was not a very intelligible delineation of the coast."³¹¹ Toolemak's verbal explanation of the sketch provided Parry with more useful information.

Accounts of Inuit understanding of European maps also vary substantially. In 1853 Rochfort Maguire noted that it "was remarkable how well" three males in the cabin on board HMS *Plover* "comprehended" official coastal charts "when their ideas were turned to it," but he added that "if I had asked them a question at another time and brought them to a chart when their mind was else where, it would have been difficult to make them un-

303. John Spink and D. Wayne Moodie, *Eskimo Maps from the Canadian Eastern Arctic*, ed. Conrad Heidenreich, Monograph 5, *Cartographica* (1972), esp. 29.

304. Mikhail Dmitrievich Teben'kov, *Atlas of the Northwest Coasts of America: From Bering Strait to Cape Corrientes and the Aleutian Islands, with Several Sheets on the Northeast Coast of Asia*, trans. and ed. Richard A. Pierce (Kingston, Ont.: Limestone Press, 1981), 76.

305. Joseph René Bellot, *Memoirs of Lieutenant Joseph René Bellot*, 2 vols. (London: Hurst and Blackett, 1855), 1:102.

306. Alexander Armstrong, *A Personal Narrative of the Discovery of the North-west Passage* (London: Hurst and Blackett, 1857), 338–39. The event was also reported by two others on the ship: Robert John Le Mesurier McClure, *The Discovery of the North-west Passage by H.M.S. "Investigator," Capt. R. M'Clure, 1850, 1851, 1852, 1853, 1854*, 2d ed., ed. Sherard Osborn (London: Longman, Brown, Green, Longmans, and Roberts, 1857), 190, and Johann August Miertsching, *Frozen Ships: The Arctic Diary of Johann Miertsching, 1850–1854*, trans. and ed. Leslie H. Neatby (New York: St. Martin's Press, 1967), 116–17. The Kangarjuatjarmiut lived near Minto Inlet.

307. Richard Collinson, *Journal of H.M.S. "Enterprise," on the Expedition in Search of Sir John Franklin's Ships by Behring Strait, 1850–55*, ed. T. B. Collinson (London: S. Low, Marston, Searle, and Rivington, 1889), 286.

308. Parry, *Journal of a Second Voyage*, 197 (note 300).

309. John Bockstoce, ed., *The Journal of Rochfort Maguire, 1852–1854*, 2 vols., Hakluyt Society Publications, ser. 2, nos. 169–70 (London: Hakluyt Society, 1988), 2:501–50 (app. 7: Dr. John Simpson's Essay on the Eskimos of Northwestern Alaska), esp. 541.

310. Thomas Simpson, *Narrative of the Discoveries on the North Coast of America* (London: R. Bentley, 1843), 129, 132, 171.

311. William Edward Parry, *Journals of the First, Second, and Third Voyages for the Discovery of a North-west Passage from the Atlantic to the Pacific*, 6 vols. (London: J. Murray, 1828–29), 4:100–101.

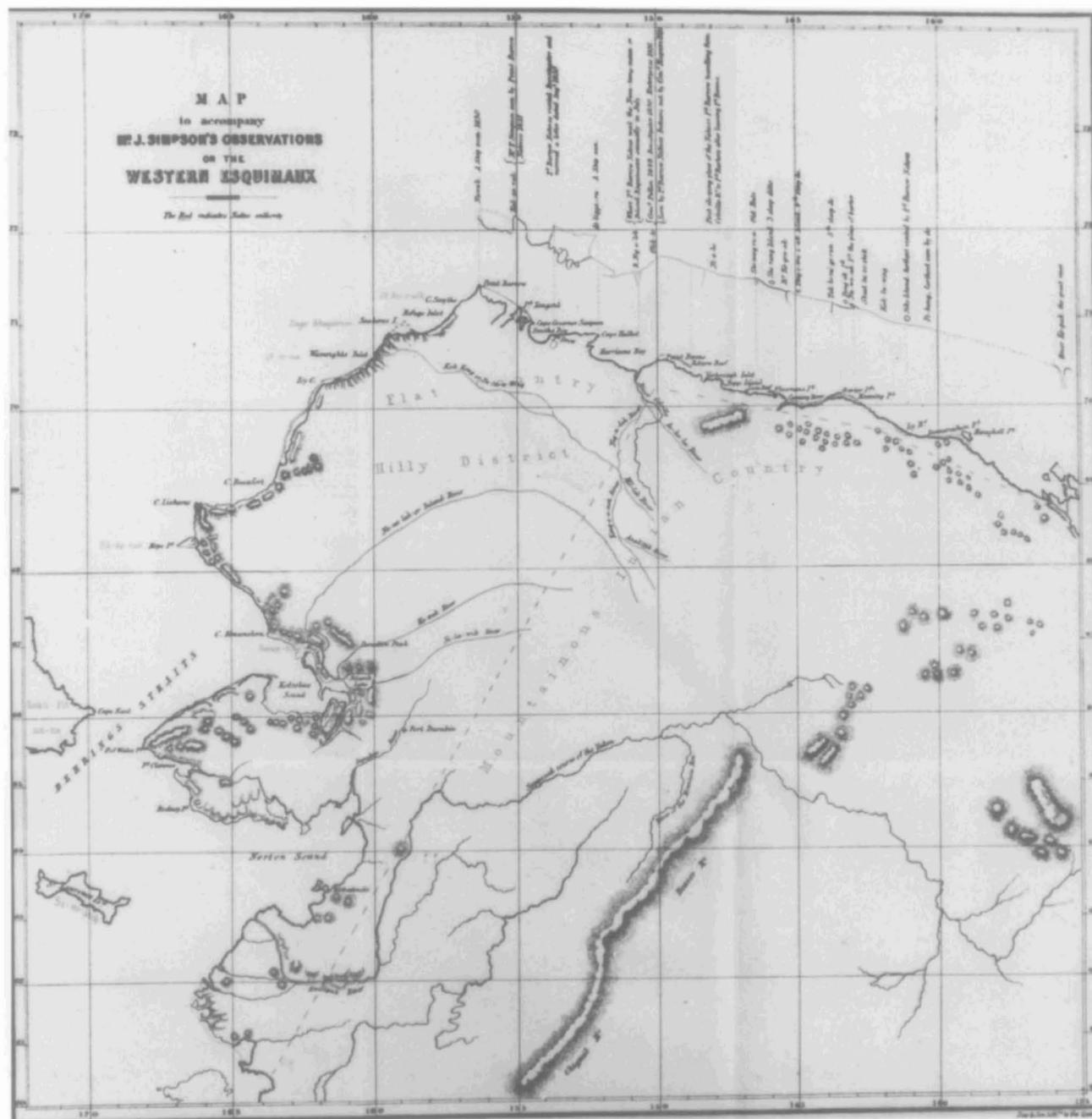


FIG. 4.88. TWO CHARTS OF THE SAME COAST. One coastline is in black based on an Admiralty chart, and the other, more northerly and drawn in red parallel to it, is derived from a chart drawn in May 1853 by Erk-sin'-ra, an Inuit shaman. In ten places the native chart is correlated with the Admiralty chart by a linking dotted line.

derstand any thing about it.”³¹² Based on his experience with the Copper Eskimos between 1913 and 1916, Diamond Jenness took a contrary view. He reported that “not a single native was encountered who had the slightest conception of a map, with the sole exception of Uloksak. Even he had only a vague comprehension.”³¹³

Size of the original: 36.6 × 37 cm. From *Further Papers relative to the Recent Arctic Expeditions in Search of Sir John Franklin and the Crews of H.M.S. “Erebus” and “Terror”* (London: G. E. Eyre and W. Spottiswoode, 1855), 916. Photograph courtesy of Special Collections and Rare Books, Wilson Library, University of Minnesota, Minneapolis.

Something of the problem some Inuit faced in interpreting Euro-American maps was recognized in 1846

312. Bockstoe, *Journal of Rochfort Maguire*, 1:235 (note 309).

313. Diamond Jenness, *The Life of the Copper Eskimos*, Report of the Canadian Arctic Expedition, 1913–18, vol. 12, pt. A (Ottawa: F. A. Acland, 1922), 229.

by F. A. Miertsching, a Moravian missionary at Okkak (Okak) village on the Labrador coast. In the course of teaching geography to adult Inuit, he made use of a globe but found that

much patience and pains is needful to make these . . . people understand these representations of the earth's surface; for some of them think the [Euro-Americans'] maps very imperfect, because on the coast of Greenland, for instance, they observe no figures of houses, tents, kayaks, or seals; so also they are greatly disappointed, to find London marked on the map with a simple "o," though it contains such a number of people, houses, and ships. It is not till after the matter has been long discussed, that we can get into anything like clearness.³¹⁴

For these Inuit, and probably others, interpretation of a map obviously depended at least as much on the context as on the form of the representation.

Contemporary records of observations made by Arctic explorers, though usually precise, lack the environmental contexts and anthropological insights needed to derive conclusions concerning mapmaking skills. Likewise, the corpora of extant maps do not in themselves afford adequate evidence on which to compare the qualities of Inuit maps with those of other traditional peoples. It is clear, however, that Inuit notions of "map accuracy" are very different from those in the West.

EPHEMERAL MAPS

Like other North American natives, Inuit people made ephemeral maps in sand or snow, among themselves and for others.³¹⁵ Because most of the early contacts between Euro-Americans and Inuit were on shorelines, many accounts describe ephemeral maps made in sand or with pebbles or beach detritus. For instance, Frederick William Beechey described an incident in 1826 in which a group of Bering Strait Eskimos

constructed a chart of the coast upon the sand, of which I took very little notice at the time. . . . they renewed their labour, and performed their work upon the sandy beach in a very ingenious and intelligible manner. The coast line was first marked out with a stick, and the distance regulated by the days' journeys. The hills and ranges of mountains were next shown by elevations of sand or stone, and the islands represented by heaps of pebbles, their proportions being duly attended to.³¹⁶

Villages and fishing stations were marked by sticks, and in one case the fact that a channel was so narrow that two boats could not paddle abreast was indicated with paddling motions and pieces of wood representing the boats. At one point, Beechey corrected the location of one of the

Diomed Islands. The mapmaker at first objected, but another Inuit pointed out that the islands were lined up ("seen *in one*") from Cape Prince of Wales, supporting Beechey's correction, and the other Inuit concurred.³¹⁷ This account is of interest not only for the graphic description of the marking out and three-dimensional modeling. It also contains rare evidence of scaling in days' journeys, attention to the proportional size of features, and the geographical principle of alignment. Less exceptional, but of interest, is the account of the involvement of bystanders in resolving a difference of opinion about the placement of an island.

MAPS ON PAPER

Most surviving nineteenth-century Inuit maps were made on paper at the request of explorers, ethnographers, or collectors working for museums. Some of their content was probably included in response to questions by these Europeans and Euro-Americans, who almost always wrote toponyms and notes on the maps.

One method commonly used by explorers seeking geographic information was to draw a map of the area as far as it was known, or to use an existing chart and ask Arctic natives to continue it. Such a method required that the Inuit have both mapping skills and an understanding of European maps. In 1830, Netsilik showed both when they extended John Ross's map of the land between Repulse Bay and Prince Regent Inlet (plate 8).³¹⁸ In another case, the representation of the seaward limit of land ice on the east coast of Melville Peninsula in the spring, when coastal travel was easier across the ice than on the land, was probably included by the Iglulik woman Illigliak at Parry's request (fig. 4.89). Parry drew a stretch of coastline on the lower part of the paper, and Illigliak added the shaded portion, apparently providing the information for the written notations of "musk oxen," "fresh water fish & Deer," and "Seals but no Walrus's or Whales." Illigliak was referred to by G. F. Lyon as one of "our [two] hydrographers."³¹⁹ Parry was explicit in his opinion that better-quality maps could be obtained from the Inuit by providing a chart of land already known and asking for it to be extended, "if information and not mere curiosity be the object."³²⁰

314. F. A. Miertsching, "From Okkak," *Periodical Accounts of the Work of the Moravian Missions*, 1846, 338.

315. See Spink and Moodie, *Eskimo Maps*, 4–5, for example (note 303).

316. Frederick William Beechey, *Narrative of a Voyage to the Pacific and Beering's Strait* (London: H. Colburn and R. Bentley, 1831), 290.

317. Beechey, *Narrative of a Voyage*, 291.

318. Ross, *Narrative of a Second Voyage*, 1:259–60 (note 300).

319. G. F. Lyon, *The Private Journal of Captain G. F. Lyon, of H.M.S. "Hecla"*, new ed. (London: J. Murray, 1825), 160.

320. Parry, *Journal of a Second Voyage*, 196 (note 300). Facing p. 198

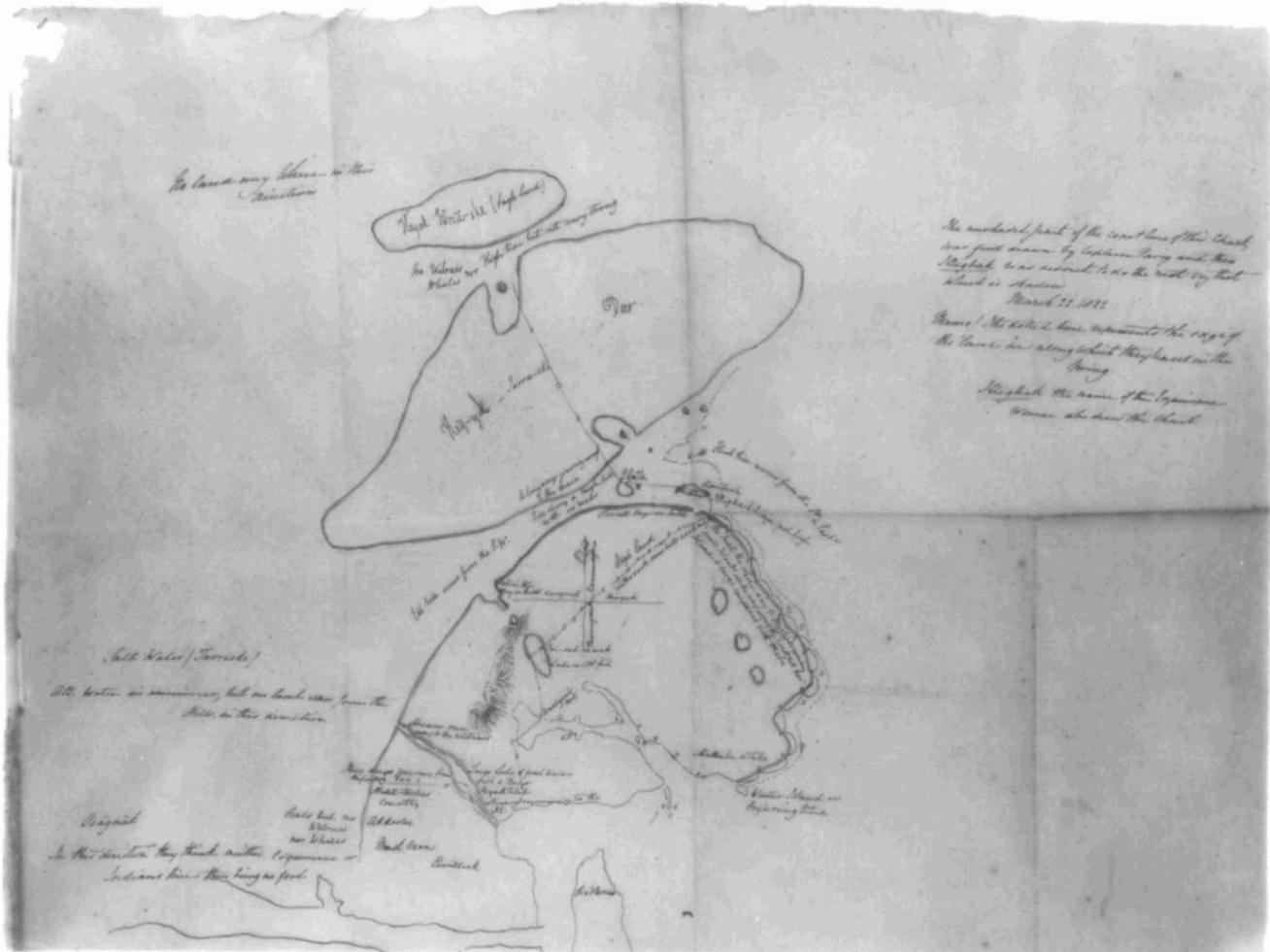


FIG. 4.89. ILLIGLIAK'S MAP OF THE MELVILLE PENINSULA AND BAFFIN ISLAND, NORTHWEST TERRITORIES. Iglulik, March 1822; manuscript, ink on tracing paper with the coastline drawn by Illigliak and enhanced with blue wash. The inscription on the right reads: "The unshaded part of the coastline of this Chart was first drawn by Captain Parry and then *Illigliak* was desired to do the rest: viz that which is

shaded March 22.1822 Memo/The dotted line represents the edge of the land ice along which they travel in the Spring. *Illigliak* the name of the Esquimaux Woman who drew the chart."

Size of the original: 44.5 × 59.5 cm. Photograph courtesy of the Board of Trustees of the National Museums and Galleries on Merseyside, Liverpool (Liverpool Museum, 1957.1).

In the winter of 1897–98, Meliki, a member of the Aivilingmiut group of Igluliks, drew in pencil on paper a good example of a small-area map (fig. 4.90). It was of Cape Fullerton harbor on the northwest coast of Hudson Bay, the winter quarters that year of the New England whaling captain George Comer, who later worked as a collector of Inuit artifacts for Franz Boas of the American Museum of Natural History in New York.³²¹ During winter the coastal waters were frozen, and on the map it is not easy to distinguish the coast. Two components dominate: profiles of Comer's two sailing ships and a series of circular snow houses represented in plan. There are a number of erasures that seem to show Meliki was striving to achieve a careful representation. The snow houses are shown according to their internal plans. A rough

is an engraved version of Illigliak's map: "Eskimaux Chart No. 2. The shaded parts drawn by Illigliak at Winter Island, 1822. The Original in the Possession of Cap. Perry," it includes the "Line of Ice along which the Eskimaux travel in the Spring" but excludes other thematic content concerning the direction of flood tides and ebb tides and the locations of "Deer" and "Musk Oxen." For a thorough and insightful analysis of Parry's use of Inuit maps, see Bravo, *Accuracy of Ethnoscience* (note 31). Bravo's monograph arises from his dissertation, "Science and Discovery in the British Search for a North-west Passage, 1815–1825" (Ph.D. diss., Cambridge University, 1992).

321. Comer was one of a trio collecting Inuit artifacts for Boas. The other two were the Scottish whaling captain James Mutch and a missionary, Rev. Edmund J. Peck, who was at Cumberland Sound from 1894 to 1905. All three collected Inuit maps. Those collected by Comer and Mutch are in the American Museum of Natural History. Five collected by Peck are in the Anglican Church of Canada Archives, Toronto, file XXXIII.

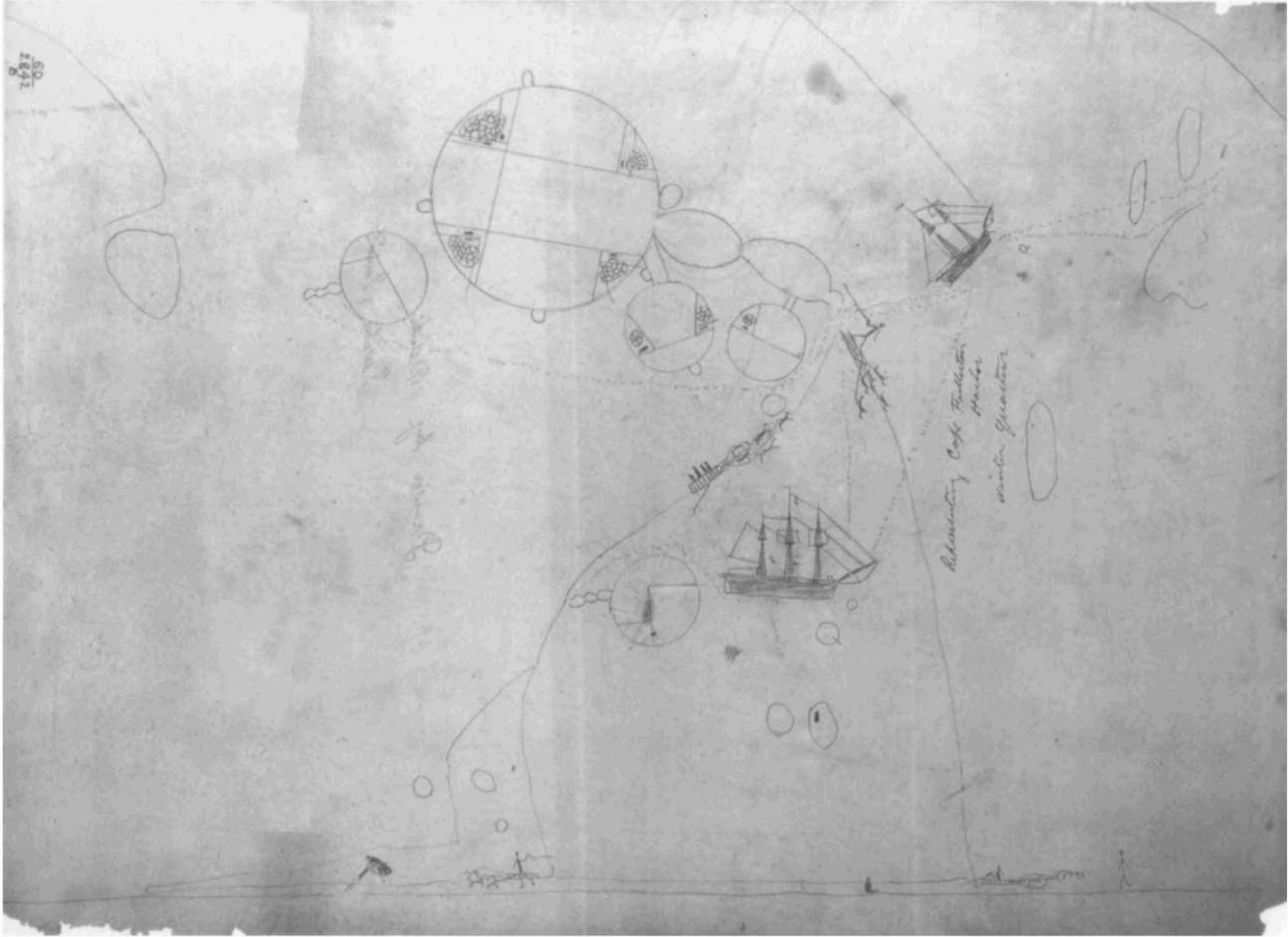


FIG. 4.90. PLAN OF ACTIVITIES AT CAPE FULLERTON HARBOR, BY MELIKI, AN IGLULIK, CA. 1898. Endorsement on back: “Drawn by Meliki, Iwilic Inuit”; on front: “Representing Cape Fullerton Harbor winter quarters,” in ink, presumably in George Comer’s hand. The map apparently shows the winter quarters of the Connecticut whaler Captain George Comer. Comer presented it to Franz Boas, anthropologist

at the American Museum of Natural History in New York, for which he was later to become an official collector of Inuit artifacts. Size of the original: 41.5 × 57 cm. Photograph courtesy of the Department of Library Services, American Museum of Natural History, New York (cat. no. 60/2842-B).

sketch that accompanied the map identifies the occupants of some of the sleeping benches.³²² Notwithstanding the disproportional size of the elements of the drawing, the whole has the connectivity characteristic of a map: dogsled routes to and from places beyond its limits; footpaths between snow houses and ships; and what appear to be coasts.

Within a year or two of making the map of Cape Fullerton harbor, Meliki made a map for Comer showing one journey to hunt musk oxen in the winter of 1893–94 and apparently two other journeys taken in 1895–96 and in 1897–98 (fig. 4.91). The area depicted was west of Roes Welcome Sound in what is now Keewatin District. Evidently the distances traveled were considerable. Dots placed along the routes to “indicate where Igloes were built” suggest journeys inland of perhaps one month. Although an igloo may have been occupied for more than

one night, the interval between adjacent igloos presumably represented one day’s journey, since overnight sleeps in winter would have been impossible without them. Interestingly, the spacing of dots on the protected and presumably smoother ice of Wager Bay is much wider than the average spacing either on land or on the presumably rougher coastal ice of Roes Welcome Sound. Even on land the space between adjacent dots varies considerably, much as it does on the map of the area between the Red Deer and upper Missouri Rivers made in 1802 by the Blackfoot chief Ki oo cus (fig. 4.62 above), on which each circle represents a night’s sleep. On Meliki’s map, clusters

322. The sketch in pencil, “place of Igloos as drawn by Meliki, January 25, 1898,” is on the back of a print titled “Iris,” 24.5 × 16 cm, Department of Anthropology, American Museum of Natural History, New York (cat. no. 60/2842 I).

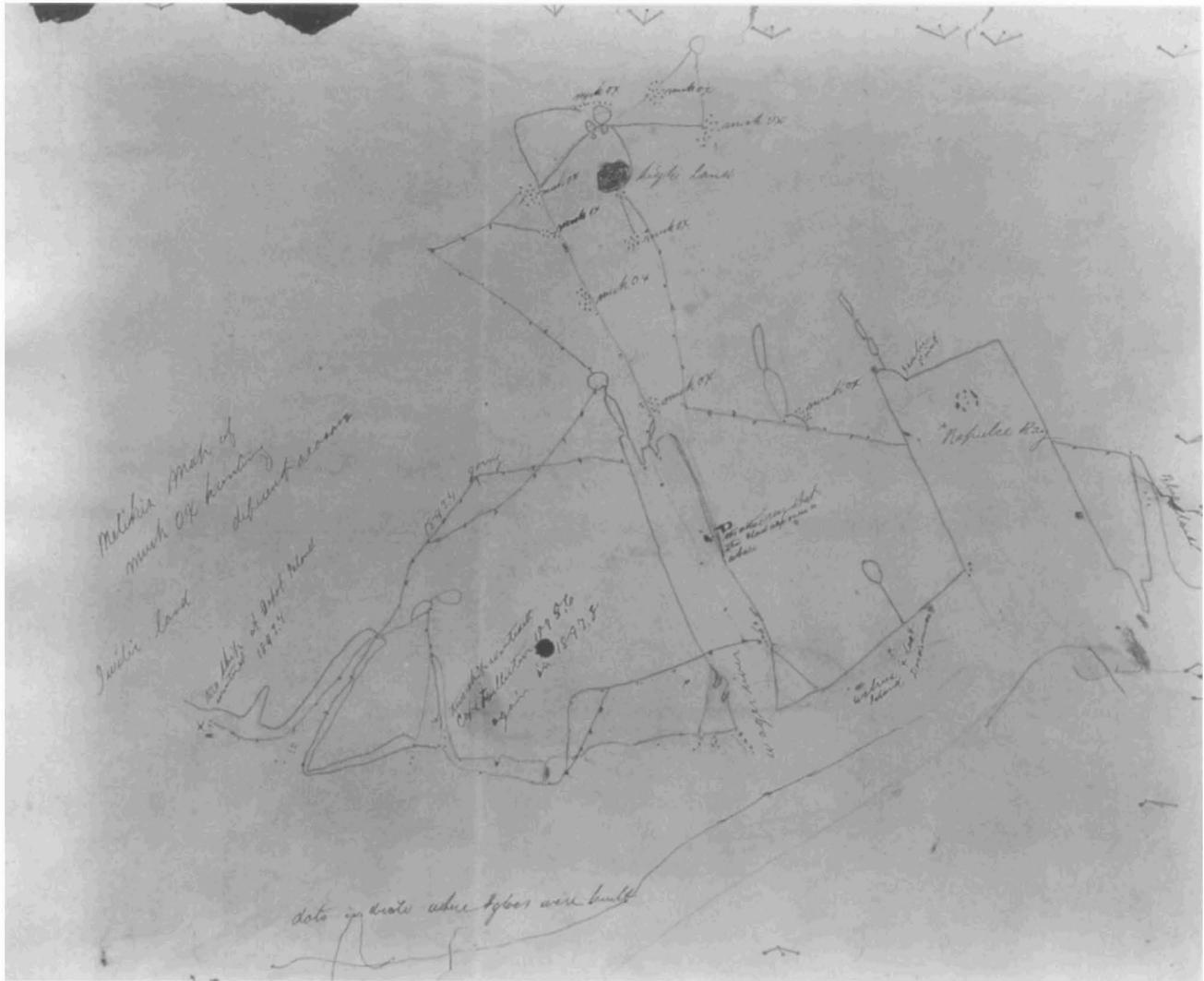


FIG. 4.91. MELIK'S MAP OF MUSK OX HUNTING BETWEEN CHESTERFIELD INLET AND REPULSE BAY, CA. 1898. Untitled Aivilingmiut manuscript map of the west coast of Southampton Island, Roes Welcome Sound, and the mainland between Depot Island and Repulse Sound. Linework in pencil with names and legends in ink. Although George Com-

er's inscription indicates "musk ox hunting diferent seasons," only the first part of the "1893.4 going" route is represented unambiguously.

Size of the original: 41.5 × 56.5 cm. Photograph courtesy of the Department of Library Services, American Museum of Natural History, New York (60/2842/E).

of eight to fifteen dots indicate the locations and, presumably, relative sizes of ten herds of musk oxen. No other animals are represented. A legend in Wager Bay indicates that "the natives say that this island was once a whale."

A detailed map that included the same region as well as more of the coastline south of Cape Fullerton was made for Comer at about the same date by Teseuke, another Aivilingmiut (fig. 4.92). Teseuke used small dots to show the location of the herds in detail. In addition, near the center of the map (lower left on detail shown in fig. 4.92) on the fast ice south of Cape Fullerton is a pictographic scene of Inuit with spears, sleds, dogs, and dog whips. One Inuit is engaged in killing an animal, and the

(Facing page)

FIG. 4.92. DETAIL FROM TESEUKE'S MAP OF ANIMAL RESOURCES AND HUNTING ACTIVITIES ON BOTH SIDES OF ROES WELCOME SOUND, 1898. "Drawn by Teseuke Harry 1898 Iwilic [probably Aivilingmiut] Inuit"; the map is manuscript, ink and crayon on paper. This remarkably detailed map contains such locational details as "salmon," on the river northwest of Cape Fullerton, and "Bear said to be plentiful," on what appears to be White Island off the north coast of Southampton Island.

Size of the original: 97.5 × 64.8 cm.; this detail: ca. 52 × 37 cm. Photograph courtesy of the Department of Library Services, American Museum of Natural History, New York (60/2842/A).

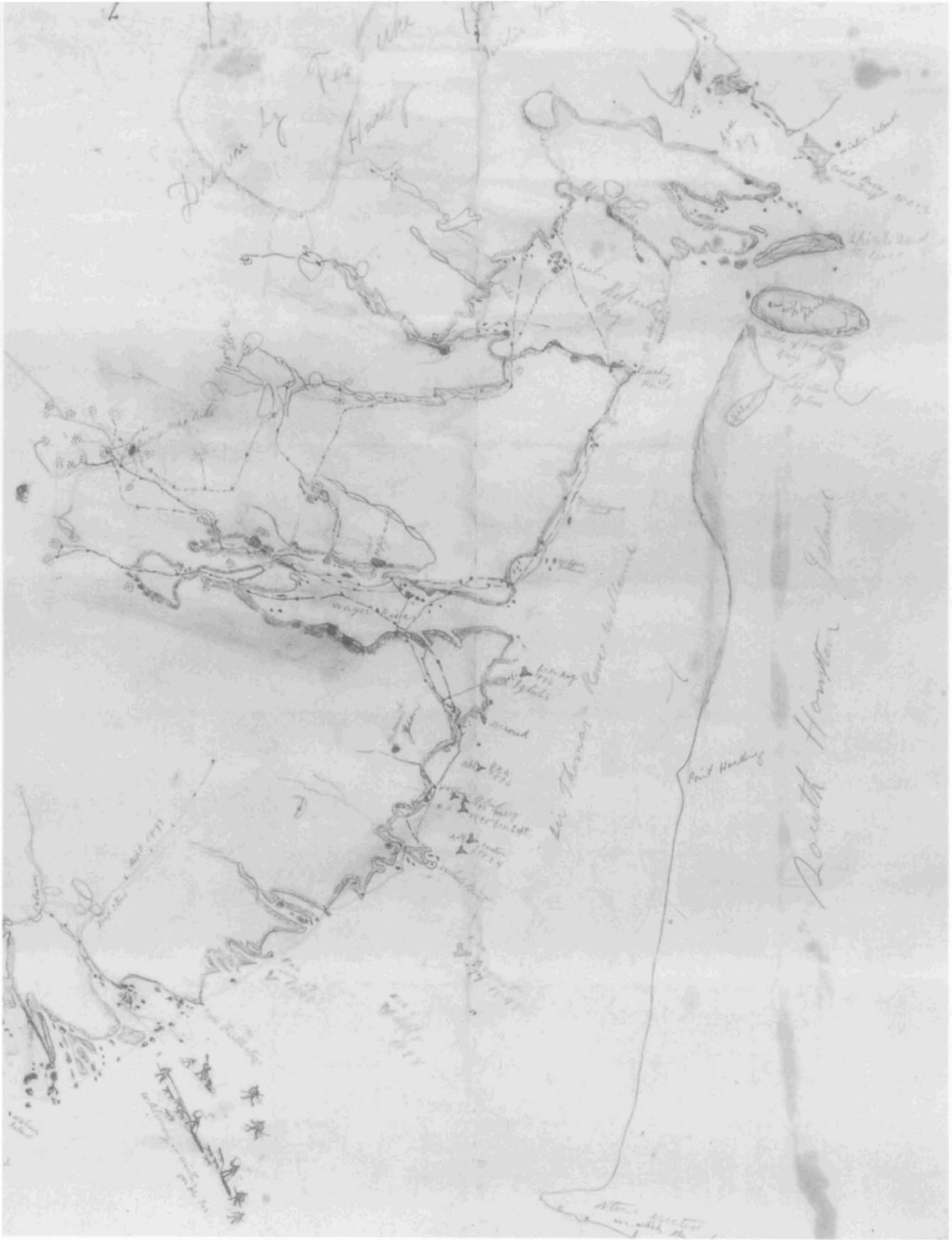




FIG. 4.93. WETALLTOK'S MAP OF HIS FORMER HOME, THE BELCHER ISLANDS IN HUDSON BAY. Inuit, probably Quebec, untitled manuscript in pencil of the Belcher Islands drawn on the back of a missionary print by the Inuit Wetalltok sometime before December 1910. Flaherty's chance look

scene has the inscription "walrusing in winter on the ice." As with Meliki's map for hunting musk oxen, however, native lore is acknowledged by an inscription on what ap-

pears to be Vansittart Island just across Frozen Strait (upper right): "Spirits said to live on this Island." Meliki's and Teseuke's maps were of the region south of and con-

at this map led to the discovery of iron ore resources on the long-forgotten islands. Size of the original: 35.5 × 31.5 cm. Photograph courtesy of the American Geographical Society Collection, University of Wisconsin-Milwaukee Library (Rare 772.3-c/.B44 A-19--).

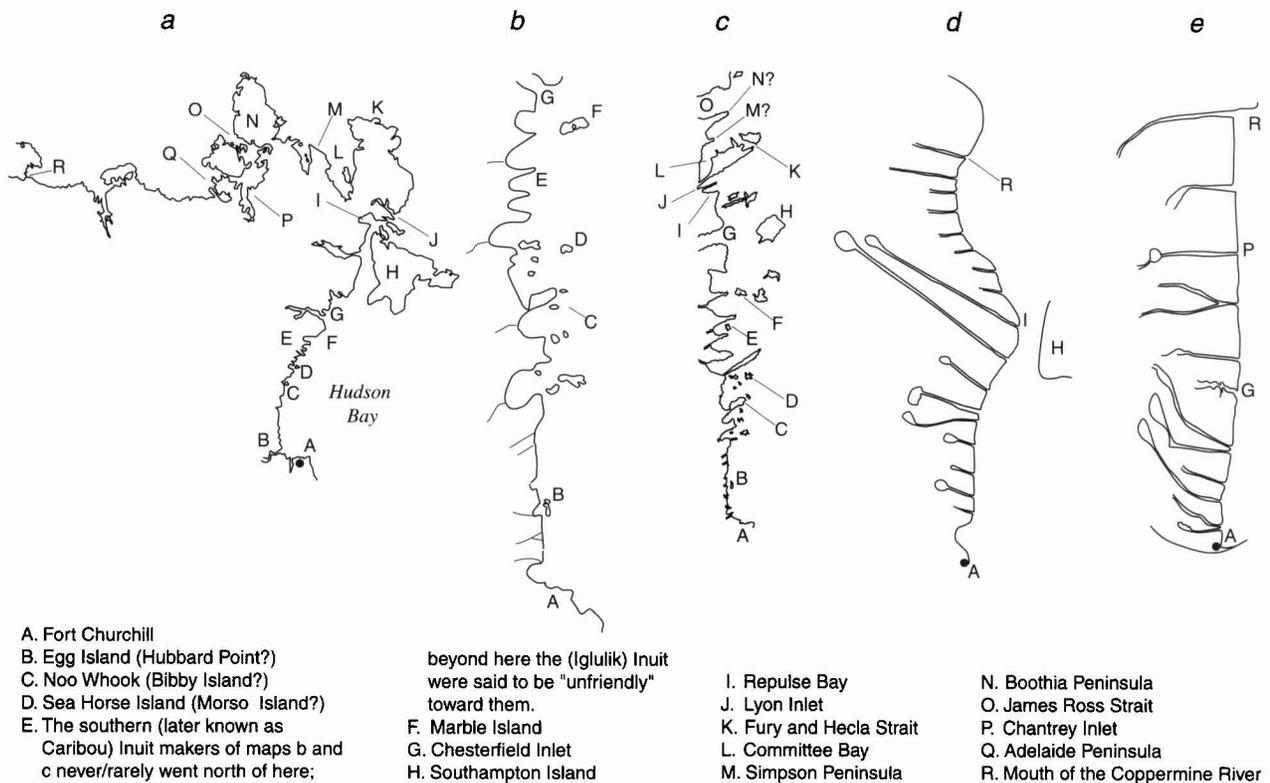


FIG. 4.94. MODERN, INUIT, AND INDIAN REPRESENTATIONS OF THE HUDSON BAY COASTLINE. Shown are one modern, two nineteenth-century Inuit, and two eighteenth-century Indian representations of four thousand kilometers of the coastline of the Northwest Territories. The coastline from a modern map is shown in *a*; *b* is based on the

1809 map of Nay hik til lok; and *c* is based on the Inuit map communicated by William Auld, 1820 (fig. 4.95). The Indian representation in *d* is based on a post-1742 draft of a map incorporating pre-1720 Indian maps (fig. 4.83), and *e* is based on Meatonabee and Idotlyazee's map, ca. 1767 (fig. 4.81).

tiguous to that mapped by Illigliak, the Iglulik woman, almost eighty years before (fig. 4.89 above).

At least one well-known Inuit map appears to have been made not at the behest of scientific explorers or ethnographers, but perhaps to satisfy nostalgia for a distant homeland (fig. 4.93). In 1910 Robert Flaherty, on Charlton Island in James Bay en route to prospect for iron ore on the Nastapoka Islands off the eastern coast of Hudson Bay, met an Inuit, Wetalltok, who from a "litter [of] odds and ends . . . drew out an old coloured lithograph, tattered and torn. On the back of it, in pencil and crudely drawn, was a map, obviously handiwork of his own."³²³ It was a map of Wetalltok's former home, the Belcher Islands, drawn on the back of a missionary print. The Belcher Islands, which were far to the north of Charlton Island, much farther out in Hudson Bay than the Nastapoka Islands, had been almost forgotten by Euro-Americans. Flaherty's own maps showed the Belcher Islands as very small, and he doubted that a land mass so big—from Wetalltok's description of travel times the main island was about 160 kilometers long—could have gone unnoted for so long. Wetalltok gave Flaherty the map,

saying he had others, and in subsequent expeditions it was found that the map had quite accurately depicted the extensive and intricately shaped islands.³²⁴

Within a few years Wetalltok's map received wide publicity. In 1918 a facsimile was reproduced in a much respected, widely read journal.³²⁵ The remarkable detail in which Wetalltok had mapped an extremely complex series of islands, however, was not fully appreciated until the 1960s, when accurate 1:500,000 topographic maps were published.

Two maps by Inuit and two by Subarctic Indians (figs. 4.81 and 4.83 above) of the coastline north of Churchill on Hudson Bay provide an opportunity to compare maps of a single area. All four maps show the long

323. Robert Joseph Flaherty, *My Eskimo Friends*: "Nanook of the North" (London: Heinemann, 1924), 18.

324. Flaherty, *My Eskimo Friends*, 18–47, esp. 41.

325. Robert Joseph Flaherty, "The Belcher Islands of Hudson Bay: Their Discovery and Exploration," *Geographical Review* 5 (1918): 433–58, esp. fig. 4. Subsequently Flaherty published *My Eskimo Friends* and made the famous documentary film, *Nanook of the North* (1922).

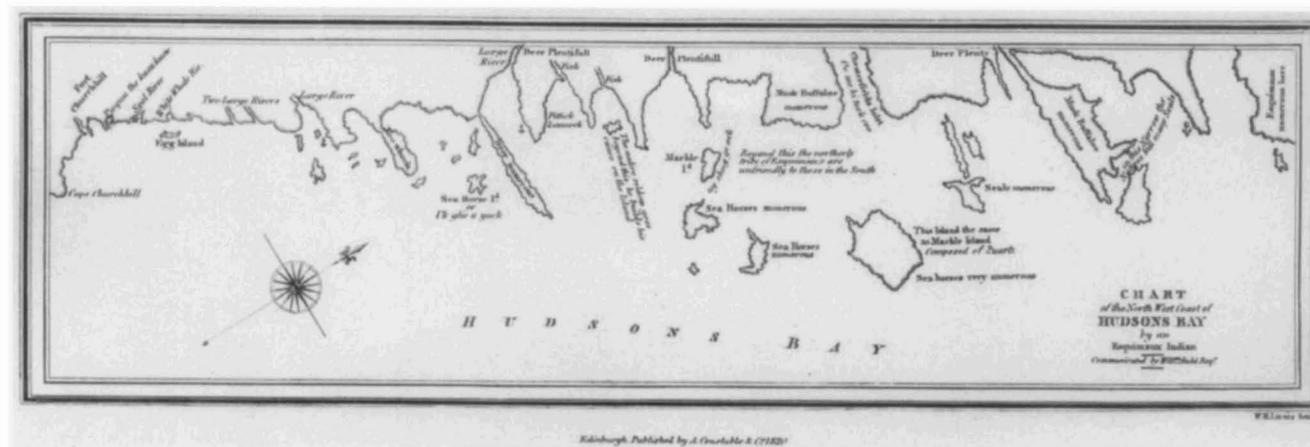


FIG. 4.95. UNKNOWN INUIT'S (PROBABLY CARIBOU ES-KIMO) CHART OF THE NORTHWEST COAST OF HUDSON BAY, PRE-1821. Engraved and published version of a chart "by an Esquimaux Indian." In contrast to the Subarctic Indian maps of this coast (see figs. 4.81, 4.83, and 4.94), this chart exaggerates the headlands, islands, bays, and inlets,

doubtless reflecting the Inuit's greater familiarity with and economic dependence on the seacoast.

Size of the original: 7.2×27.4 cm. From *Edinburgh Philosophical Journal* 4 (1821), lower part of pl. V at end of volume.

and complex coast as essentially straight (fig. 4.94). The earlier of the two Inuit maps, a transcript by Peter Fidler of an 1809 sketch by Nay hik til lok, begins just south of Fort Churchill and terminates to the north immediately beyond named Chesterfield Inlet (a section of the coast that is indeed essentially straight).³²⁶ The second, by an unnamed Inuit, was communicated to the Wernerian Society in 1820 by William Auld and is known only in an engraving published with the society's proceedings (fig. 4.95).³²⁷ Beginning at the same point as Nay hik til lok's map, it depicts the coastline far beyond Chesterfield Inlet. The long, distinctively shaped, narrow-based peninsula where "Musk Buffaloe [Oxen are] numerous" and where, at its distal point, is a "Narrow [where] the Natives kill many Seals" are very probably Melville Peninsula and Fury and Hecla Strait. The narrow base of the peninsula was later named Rae Isthmus, and the short but needlelike peninsula immediately to its left was almost certainly a representation of elongate Vansittart Island, between Repulse Bay and Lyon Inlet, which is connected to the mainland by fast ice for much of the year and separated from it by only a few kilometers at other times. Interpreting the coast beyond is more speculative, but there is no overall change in its direction at the fulcrum of Fury and Hecla Strait. This custom of representing long coastlines as essentially straight was common among Inuit and Subarctic Indians.

MAPS ON IVORY AND WOOD

The Inuit and Eskimos have a long tradition of engraving walrus tusk ivory. In Alaska, archaeological evidence indicates that pictorial engraving, generally of single sub-

jects, began in late prehistoric times. By the early nineteenth century, objects made from carved ivory were being decorated with representations of humans, man-made objects, and animals, almost always in profile. No maps are known to have been made in this traditional style. Maps were engraved on ivory by Alaskan natives beginning in the late nineteenth century, when a commercial trade in ivory objects was established, centered at Saint Michael. The Alaska Commercial Company fostered the market by supplying walrus ivory to increasingly specialized engravers, whose work was characterized by the engraving of whole walrus tusks, larger figures, more detail, and the frequent use of the Western pictorial style seen by the Inuit in printed graphics.³²⁸

326. The Inuit-drawn coastline in figure 4.94b is based on a transcript by Peter Fidler of an "Is ke mo Sketch" of the west coast of Hudson Bay beginning at Churchill and continuing north to a point immediately beyond Chesterfield Inlet, in two sections: "Drawn by Nay hik til lok an Iskemo 40 years of age 8th July 1809," ink on paper, 19×24.7 cm, Hudson's Bay Company Archives, Winnipeg (E3/4, fol. 16r, lower part of page; not illustrated here). Figure 4.94c is based on a map transcribed by William Auld (see fig. 4.95).

327. On 2 December 1820, Professor Robert Jameson had exhibited at a meeting of the Wernerian Society in Edinburgh "a chart of the north-west side of Hudson's Bay, drawn by an Esquimaux," "Proceedings of the Wernerian Natural History Society," *Edinburgh Philosophical Journal* 4 (1821): 194–96. It was almost certainly the manuscript in the possession of William Auld. William Auld Sr. had served the Hudson's Bay Company between 1790 and 1815, much of the time at Churchill. He retired to Leith, near Edinburgh. His son William Auld Jr. also served the Company in Canada, returning to London with his brother on 26 October 1820. Hence either father or son could have supplied the manuscript from which the engraving was made.

328. Saint Michael had been a United States Signal Service Station since 1874 and was the center from which E. W. Nelson collected arti-

Maps were produced as souvenirs for this market in relatively large numbers, and many have survived. They were apparently made by a few specialist engravers, of whom several members of the Kakarook family working at Saint Michael were particularly important. Almost all the known extant examples contain toponyms and are of the coastline and offshore islands in the region of Norton Sound, Seward Peninsula, and Kotzebue Sound. In almost every case the source seems to have been a published map, suggesting heavy influence by Western markets. Because the medium was elongate and gently curved, the engraver almost always had to straighten the coastline. Some of the examples were merely cartographically decorated tusks, whereas others had legs or supports and were designed to function as cribbage boards (fig. 4.96). Although such maps are noteworthy, they are exceptional, characteristic of a small area at a late date, and derived from printed sources rather than traditional knowledge or individual experience.

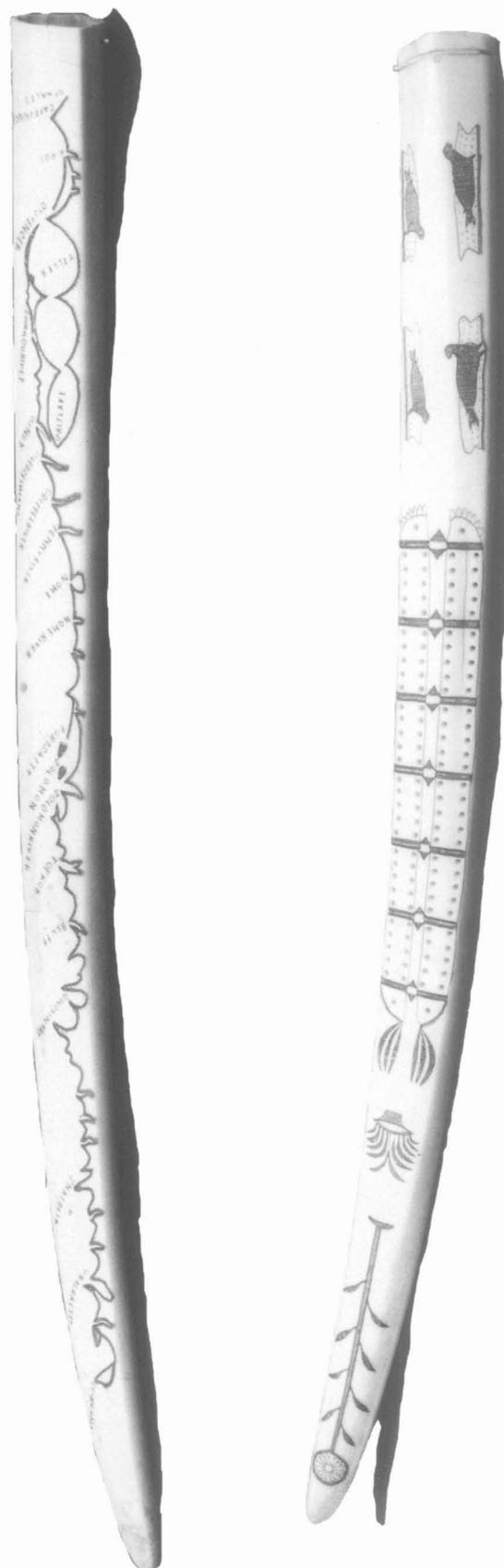
As with North American Indians, there does not appear to have been a widespread tradition among the Inuit of carving, painting, or drawing mobiliary maps on wood. One group, however, the Ammassalik Eskimos on the east coast of Greenland, appear to have made wooden maps, examples of which were collected in the late nineteenth century.³²⁹ Members of the Amdrup expedition of 1898–1900 collected an example of one type, a bas-relief coastal map on a wooden board (fig. 4.97). Thalbitzer, who led a later expedition to the area, believed that this map and apparently others were products of “later

facts for the Smithsonian Institution between 1877 and 1881. See Dorothy Jean Ray, *Eskimo Art: Tradition and Innovation in North Alaska* (Seattle: University of Washington Press, 1977), 22–28.

329. The maps are discussed and illustrated in Gustav Frederik Holm, “Ethnological Sketch of the Angmagsalik Eskimo,” and William Carl Thalbitzer, “Ethnographical Collections from East Greenland (Angmagsalik and Nualik) Made by G. Holm, G. Amdrup and J. Petersen,” both in *The Ammassalik Eskimo: Contributions to the Ethnology of the East Greenland Natives*, 2 vols., ed. William Carl Thalbitzer, Meddelelser om Grønland, 39–40 (Copenhagen, 1914), 1:1–148, esp. 107, and 1:319–754, esp. 665–66. Holm’s Danish original: *Den Østgrønlandske Expedition, udført i Aarene, 1883–85, Meddelelser om Grønland*, 10 (Copenhagen, 1888), esp. pl. XXXXI.

FIG. 4.96. MAP OF PART OF THE WEST COAST OF ALASKA ENGRAVED ON A WALRUS TUSK CRIBBAGE BOARD. Bering Strait Inuit, late nineteenth century. The coast represented, from Cape Prince of Wales to Saint Michael, bounds most of deeply indented Norton Sound but is straightened here to accord with the shape of the tusk. On the side opposite the map is a cribbage board. The hollow of the tusk was used to store the pegs.

Length of the original: 65 cm. Photograph courtesy of the Board of Trustees of the National Museums and Galleries on Merseyside, Liverpool (Liverpool Museum, 36.135.14).



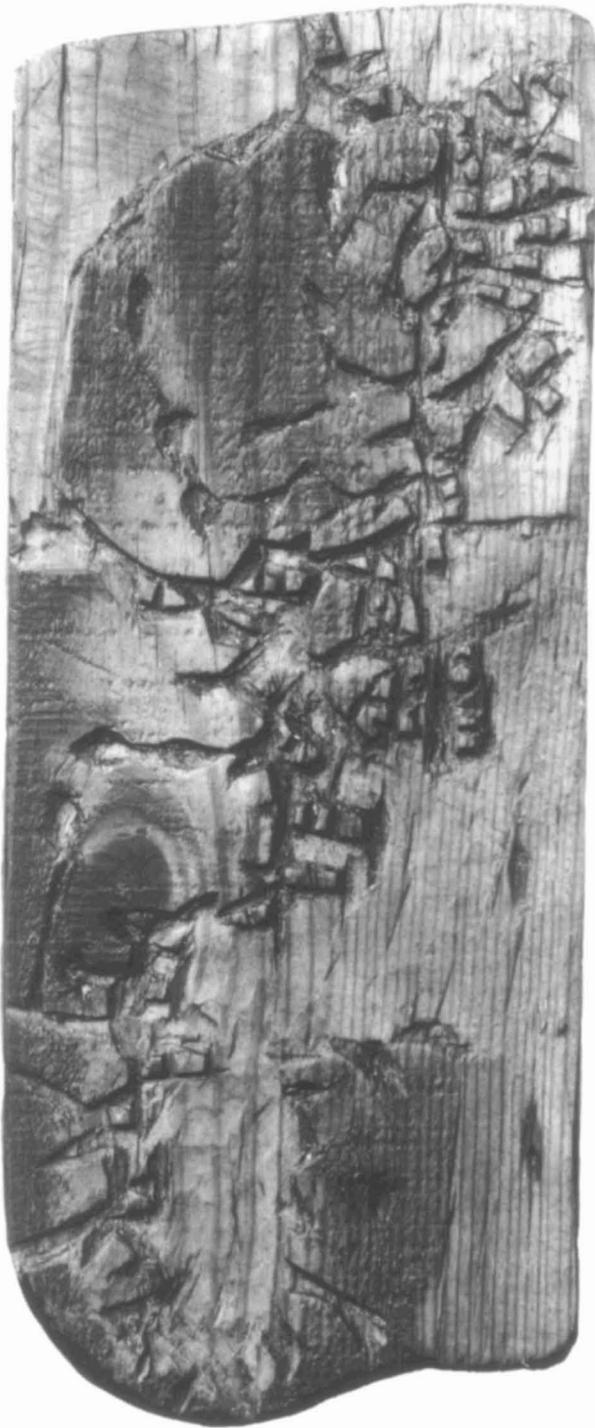


FIG. 4.97. AMMASSALIK BAS-RELIEF CARVING ON WOODEN BOARD OF AN OUTLINE OF PART OF THE EAST GREENLAND COAST, 1884–85. This type of map may have been particular to east Greenland, perhaps a post-contact development. The map shows Kap Dan, the east side of the Ammassalik (Angmagssalik) fjord. The water has been cut out and drawn with pencil. Size of the original: 20 × 8.5 cm. Photograph courtesy of the National Museum of Denmark, Department of Ethnography, Copenhagen (L. 6654).

times.” He gave no evidence for their lateness and offered no explanation for it.³³⁰ The bas-reliefs were intricately carved and required smooth, flat surfaces, such as European boardwood. Though the closest to Europe of all North American cultures (at their closest, approximately four hundred kilometers from Iceland), the Ammassaliks’ coastal territory was not on the routes of the tenth- and eleventh-century Norse or any of the several searchers for a Northwest Passage from the late fifteenth century onward. Contacts with Europeans therefore appear to have been late.

More unusual than the bas-relief tradition are three-dimensional maps that the Ammassaliks carved from blocks of wood (figs. 4.98 and 4.99). Although they could have been made out of driftwood, they probably were not, and their production must have required very sharp cutting tools. The two long edges of figure 4.98 are intricately carved; long, irregular, but carefully crafted indentations separating equally irregular but purposefully shaped protuberances. These were carved to represent actual fjords and headlands. Their sequence as represented on the right-side edge is continued on the left-side edge. The face of the wood was grooved and beveled to represent “not only the contours of the country, but also its appearance and the reliefs of the mountains.” Describing such maps, Holm drew attention to their less obvious information content: “All the places where there are old ruins of houses (which form excellent places for beaching the boat) are marked on the wood map; the map likewise indicates where a kaiak can be carried over [the interval ridge] between the bottom of two fjords, when the way round the naze [headland] between the fjords is blocked by the sea-ice.”³³¹

The map in figure 4.99 is much thinner and more nodular, each nodule representing one of a sequence of offshore islands. The coastal map in figure 4.98 and this island map were complementary, and by “manipulating the [nodular] stick so that the islands appear in their right position to the mainland, the traveller is enabled by means of this map to inform others of the route he has taken.”³³² Figures 4.98 and 4.99, as well as another map collected by Holm, were apparently made by “Kunit fra Umivik.”³³³ The only other known example was probably carved by the same man.³³⁴ There is therefore a very real possibility that Kunit was an innovator.

330. Thalbitzer, “Ethnographical Collections,” 666.

331. Holm, “Ethnological Sketch,” 107 (note 329).

332. Holm, “Ethnological Sketch,” 107.

333. Holm, *Den Østgrønlandske Expedition*, pl. XXXXI (note 329).

334. Model of the east coast of Greenland from north of Kangerdluagsuaik to Ammassalik measuring 16.4 × 5.9 cm and carved in wood perhaps by (or as a copy of one by) Kunit; Museum, Michigan State University, East Lansing, Michigan (item 896.17, 62154).



FIG. 4.98. THREE-DIMENSIONAL AMMASSALIK ES-KIMO COASTAL MAP OF PARTS OF THE FJORD COAST OF EAST GREENLAND, CARVED IN WOOD. It is not certain how such maps were used, though it seems they had to be rotated. Some specimens may have been made for collectors. Length of the original: 14 cm. Photograph courtesy of the Greenland National Museum and Archives, Nuuk.



FIG. 4.99. THREE-DIMENSIONAL AMMASSALIK ES-KIMO MAP OF ISLANDS OFF THE FJORD COAST OF EAST GREENLAND, CARVED IN WOOD. This island map complements the coastal map (fig. 4.98) when the two are positioned and moved correctly in relation to each other. Length of the original: ca. 24 cm. Photograph courtesy of the Greenland National Museum and Archives, Nuuk.

MAPS IN LATE TWENTIETH-CENTURY INUIT ART AND SOCIAL POLICY

As has occurred among Australian aborigines and many other indigenous groups, traditional map elements have become important components of Inuit commercial art. McGrath has described seven examples of Inuit art containing cartographic elements made between 1964 and 1986. All show coasts and rivers very approximately in plan, and all except the earliest show a mix of humans, animals, dwellings, or Euro-American goods (e.g., guns and ships) in profile. On the earliest example, Map of the Arctic Bay, by Toongalook (Cape Dorset, ca. 1964), the syllabics state that the artist had never made a map before and did not consider himself good at it (fig. 4.100).³³⁵

335. Robin McGrath, "Maps as Metaphors: One Hundred Years of Inuit Cartography," *Inuit Art Quarterly* 3, no. 2 (1988): 6–10, esp. 8, and see idem, "Inuit Maps and Inuit Art," *Inuit Art Enthusiasts Newsletter* 45 (1991): 1–20.



FIG. 4.100. MAP OF THE ARCTIC BAY AREA (CAPE DORSET, 1964). By Toongalook (1912–67). Graphite on paper.

Size of the original: 65.5 × 50.6 cm. Photograph from Jean Blodgett, *North Baffin Drawings* ([Toronto]: Art Gallery of Ontario, 1986), 77 (fig. 37); copyright Art Gallery of Ontario. By permission of the West Baffin Eskimo Cooperative, Cape Dorset.

Yet it is maplike: a coastline with islands and with hachuring very similar to that on many of the maps made for Franz Boas some eighty years earlier by members of an earlier generation of the same Baffin Island Inuit living several hundred kilometers to the east.³³⁶ Later examples are more stylized and less obviously cartographic.

Analysis of commercial art may well reveal changes in the spatial perceptions of Inuit artists,³³⁷ undoubtedly influenced by changing lifestyles in the twentieth century, including exposure to topographic maps. Good topographic maps now exist for vast areas for which until the mid-twentieth century there were, if any, only crude reconnaissance maps. The nucleating of the Inuit population into fewer and often larger centers has increased awareness of these. During 1973 and 1974, approximately 1,600 Inuit in thirty-three northern settlements throughout Arctic Canada participated in the Inuit Land Use and Occupancy Project. An important component was the creation of map biographies, in which each man plotted on topographic maps the areas where he had

hunted, trapped, fished, and camped during his adult life.³³⁸ Although several operational hurdles had to be overcome, the ability of Inuit to plot on printed base maps was not one of them. “If cross-checking and overall consistency are tests of truth, then it can safely be said that accuracy and honesty were in virtually every case beyond doubt.”³³⁹ The accuracy and standardization of Euro-American maps had increased dramatically during the previous century and a half. The Inuit’s ability to use them with confidence and precision had more than kept up with that change. What is not clear is the extent to which the Inuit have lost their earlier concept of map. It is interesting that, although they easily used topographical maps as a base, the Inuit mapmakers found it difficult to comprehend the categorization of phenomena suggested by Euro-Americans. Asked to indicate a hunting range, Inuit hunters used lines and loops rather than enclosing the area in a circle. When urged to use circles, they tended to mark only “inner hunting areas—the favourite spots, where kills had been made, the core areas—rather than outer perimeters.”³⁴⁰

CARTOGRAPHIC AFFINITIES BETWEEN THE EURASIAN AND AMERICAN ARCTIC AND SUBARCTIC REGIONS

Based on material assembled in this chapter and chapter 8 below, there is some evidence of stylistic, media, and contextual parallels between the Arctic and Subarctic regions of North America and Asia. Since the work of Franz Boas, it has become increasingly clear not only that “stylistic parallels around the Pacific rim are more abundant and more convincing than those around the Atlantic,” but that “the number of parallels increases and becomes more specific as one proceeds north from the mouth of the Columbia River to Bering Strait.”³⁴¹ These

336. Franz Boas elicited from Inuit more than forty maps on paper in the course of anthropological fieldwork in southern Baffin Island in 1883 and 1884. Most of these are in the National Anthropological Archives, Natural History Museum, Smithsonian Institution, Washington, D.C. (“129, 270 Eskimo,” Gift of Franz Boas, c/o Bureau of American Anthropology, through O. I. Mason, February 25, 1895, U.S.N.M. acc. 29,060). At least three others have survived in the Museum für Völkerkunde, Berlin. Of several published examples of the Boas Inuit maps, the one most similar to Toongalook’s was of Cumberland Sound, drawn by Itu, a Nugumiut; see Boas, “Central Eskimo,” fig. 545 (note 301).

337. See Peter Osmer, “Inuit Perspective in Drawings,” unpublished paper, Carleton University, 1992.

338. With the exception of the Mackenzie delta, plotting was on National Topographic System 1:500,000 topographic sheets.

339. Milton M. R. Freeman, ed., *Inuit Land Use and Occupancy Project*, 3 vols. (Ottawa: Minister of Supply and Services Canada, 1976), 2:56.

340. Freeman, *Inuit Land Use*, 2:55.

341. William W. Fitzhugh, “Crossroads of Continents: Review and

parallels include several similarities in graphics and design. For example, graphic and sculptural art was important and “was conspicuously displayed on garments and everyday artifacts and in similar types of petroglyphic art” for both the Tlingits of southeast Alaska and the Amur River peoples along the frontier of northeastern China. Interior Siberians and Athapaskans “shared certain clothing concepts and embroidery techniques and designs.” On opposite sides of the Chukchi and Bering Seas, the Maritime Chukchi/Asian Eskimos shared many cultural attributes with the Alaskan Eskimos, among which were religious life, festivals, and fur embroidery.³⁴²

Most of the American Arctic peoples Europeans met at first contact were Neo-Eskimos. Beginning in north Alaska about A.D. 1000, their ancestors had migrated rapidly eastward through the maritime Arctic, colonizing much of it by 1200 and virtually all by 1550.³⁴³ Known by archaeologists as Thule people, their language, much of their mythology, and most of their material culture derived from northern Alaska.³⁴⁴ Fine linework, pictography, and representation were characteristics of a tradition of engraving ivory and bone from northeast Asia, throughout the American maritime Arctic to east Greenland.

Among the Na-Dene-speaking northern Athapaskans of interior Alaska and the northwest Canadian Subarctic language, shamanistic beliefs and practices, as well as much folklore, have strong affinities with northeast Asia; for material culture, including art forms, this is somewhat less so.³⁴⁵ Later in prehistory, some of these peoples were drawn toward regions beyond: the Northwest Coast, with its fishing economy; the caribou-rich tundra; the boreal forests to the east of the Cordilleras; and the bison-rich northern edge of the Plains. In each they mixed with peoples already there. Ultimately, some reached the southern Plains, where, as ancestors of the Navajos and Apaches, they became involved in trading with the Pueblo societies of the Southwest.³⁴⁶ Obsidian for cutting tools and siliceous stone for flaking into tools were traded over considerable distances throughout these regions.³⁴⁷

These parallels and origins remain to be explored in the context of traditional cartography of Arctic and Subarctic peoples. Doing so will require assembling more artifactual evidence, particularly cosmographical material, which will need to be interpreted with reference to folklore and traditional worldviews.

With the reopening to the West of museum collections in the former USSR and the initiation of joint research projects between North American and Russian specialists, the time is now propitious.³⁴⁸ Cosmographical maps painted on drumheads and used by shamans in the Eurasian Subarctic probably had North American equivalents, such as the drums used by dreamers in North Athapaskan groups. Artifacts in North American collections

must be reexamined, particularly the celestial maps incorporated on the ceremonial coats of northeast Asian shamans. The Lakota sky maps and the Koryak dancing coat (plate 14) share an interesting characteristic: neither depicts celestial patterns as seen from the earth; they portray them as mirror images reflected from it. Divination practices need to be reexamined on a circumpolar basis. Not all were concerned with predictions of conditions and events in space, but some certainly were.

Vernacular kinds of mapmaking on the bark of paper birch and on blazed trees should be reexamined for similarities in their styles and distributions. It would not be surprising if there was also an indigenous North American equivalent to the decorative ceremonial maps found on a range of northeast Asian artifacts that included the handles of ritual vessels, canoe benches, and paddle blades (see below, pp. 344–48).

Parallels between traditional cartography in northwestern North America and that in northeast Asia are sufficient to suggest a common prehistoric origin rather than independent but convergent development in similar environments. Further evidence will doubtless emerge in rock art and prehistoric artifacts, especially if specialists interested in these forms develop a heightened awareness that maps might be among them. More evidence remains to be recognized in ethnographic artifacts collected during early postcontact times. Early contact written records must also be scrutinized for supporting evidence. But assessing the nature of links and dating them await a fuller understanding of the migrations of peoples and diffusion

Prospect,” in *Anthropology of the North Pacific Rim*, ed. William W. Fitzhugh and Valérie Chaussonnet (Washington, D.C.: Smithsonian Institution Press, 1994), 27–51, esp. 29. On Boas: Franz Boas, “America and the Old World,” in *Congrès International des Américanistes: Compte-Rendu de la XXI^e Session, deuxième partie tenue à Göteborg en 1924* (Göteborg: Göteborg Museum, 1925), 21–28, and idem, “Relationships between North-west America and North-east Asia,” in *The American Aborigines: Their Origin and Antiquity*, ed. Diamond Jenness (1933; reprinted New York: Russell and Russell, 1972), 357–70.

342. Fitzhugh, “Crossroads of Continents,” 34–35.

343. *Historical Atlas of Canada*, vol. 1, pl. 11 (“Peopling the Arctic,” by Robert McGhee) (note 71).

344. Robert McGhee, “Thule Prehistory of Canada,” in *Handbook of North American Indians*, ed. William C. Sturtevant (Washington, D.C.: Smithsonian Institution Press, 1984), 5:372–73.

345. Galina I. Dzeniskevich, “American-Asian Ties as Reflected in Athapaskan Material Culture,” in *Anthropology of the North Pacific Rim*, ed. William W. Fitzhugh and Valérie Chaussonnet (Washington, D.C.: Smithsonian Institution Press, 1994), 53–62. Notwithstanding the title, no conclusive evidence is presented for material cultural ties. The strongest evidence is the ornamentation of buckskin clothing (56).

346. John W. Ives, *A Theory of Northern Athapaskan Prehistory* (Boulder, Colo.: Westview Press, 1987), 351–53.

347. *Historical Atlas of Canada*, vol. 1, pl. 14 (“Prehistoric Trade,” by J. V. Wright and Roy L. Carlson) (note 71).

348. For example, since the late 1980s the Smithsonian Institution has organized cooperative archaeological, anthropological, and ethnographic programs.

of cultural traits during approximately the past ten thousand years.

CONCLUDING THEMES

In this chapter I have presented the evidence for indigenous mapmaking among native North Americans. The task now is to draw several concluding themes from this largely regional treatment. These include the methodological problems of explaining the degree of acculturation in various examples of Native American maps, their physical attributes (media), structure, information content, and social purpose.

STAGES OF ACCULTURATION

Throughout the regional accounts, the context of native encounters with Euro-Americans has been constantly in evidence. The concept of “first contact” with Europeans not only separates prehistory from history, it is associated with a change in the nature of evidence available to posterity. And this contact also foreshadowed accelerating acculturation of maps and of the contexts in which they were made and used.

As a working concept, however, the idea of first contact presents serious operational problems. First, regional variations in the date of supposed first contact were almost four hundred years apart. Hernando de Alarcón’s account of how a Halchidhoma Indian made a map of the lower Colorado River for him in 1540 could certainly qualify. Similarly, first contact has been claimed in the case of figure 4.52, the 1914 map of the territory of the then extinct Yahis in northern California made by Ishi, the last Yahi survivor.

The Halchidhoma and Yahi examples illustrate a second operational problem in applying the concept of contact: exactly how unacculturated were they? Alvar Núñez Cabeza de Vaca and three other survivors of the Narvaez expedition had probably passed some five hundred kilometers to the southeast of Alarcón’s encounter only a few years before, but members of Alarcón’s expedition were nevertheless the first Europeans ever to enter the lower Colorado Valley. One might assume, therefore, that the Halchidhoma’s map would have been unacculturated. On the other hand, in the case of Ishi in northern California, although he has been called “the last wild Indian in North America,” Euro-American traders and trappers had first entered northern California ninety years before his capture in 1911. Indeed, by that year there had been permanent Euro-American settlement very close to Yahi territory for several decades.³⁴⁹ Whereas historically early first contacts preceded (or marked the beginning of) acculturation, historically late first contacts cannot be assumed to have done so.

A third operational problem arises when we attempt to define when the period of first contact ended. The possibility of indirect acculturation arising from occasional

Spanish activities in the region during the sixteenth century cannot be discounted in the Halchidhoma example.³⁵⁰ On the other hand, even if one accepts that Ishi was “wild” when captured in 1911, was his map of 1914 an example of first contact cartography? By then he had lived for most of three years in the Museum of Anthropology, San Francisco, and had associated with eminent anthropologists.³⁵¹ We do not know whether the map was produced spontaneously or interactively with researchers, and the original is not extant. What might Ishi have inscribed or modeled on the ground before abandoning himself to Euro-American settlers only three years before, and how would it have differed from the published map?

Even allowing for the considerable differences in dates of first contact between the several parts of North America, however, there are remarkably few truly indigenous artifacts; the mid-eighteenth-century Quapaw painted hide (plate 6) may well be the oldest. Contemporary accounts of early contact map artifacts are just as rare—the earliest was probably the painted bison hide found in 1540 by Vásquez de Coronado at the Zuni pueblo Hawikuh. But there are some very useful early contact accounts of mapmaking in what appear to have been traditional ways—for example, Jacques Cartier’s account of St. Lawrence Iroquoian men modeling a map of the Lachine Rapids and upper St. Lawrence River in 1541. Indeed, accounts afford the best evidence of early contact maps, outnumbering extant maps almost two to one. It is through such accounts that we know, for example, of the widespread use of birchbark as a map medium in the Northeast, the near ubiquity of modeling on the ground, and the indigenous use of maps in teaching and planning.

A recent global analysis of current mapmaking by indigenous peoples in the context of conservation projects recognizes three levels of basic mapping activity that may help clarify the distinction between contact and post-contact cartography in history. The first level consists of maps intended as communication tools for use while the environmental appraisal is in progress. These tend to be ephemeral, from outlines in the sand to arranging colored materials on the ground to make maps. Their simplicity and flexibility make them ideal for communicating within and between local groups. At the second level, sketch mapping commences with interaction between technicians and practitioners in medicine, agriculture, hunting,

349. Goetzmann and Williams, *Atlas of North American Exploration*, 148–49 (note 184), and Helen Hornbeck Tanner, ed., *The Settling of North America: The Atlas of the Great Migrations into North America from the Ice Age to the Present* (New York: Macmillan, 1995), 128–29.

350. Goetzmann and Williams, *Atlas of North American Exploration*, 32–33 and 36–39.

351. According to a later source, which reproduces another redrafted version of the map, it “was Ishi’s first attempt at map making drawn at the Museum of Anthropology, about 1914” (Kroeber, *Ishi*, 215 [note 216]).

and fishing and sometimes involves training local residents as surveyors to gather and map the data. The third level involves combining the sketch maps with existing topographic maps to produce documents acceptable for transactions with external agencies. Such maps are recognized as evidence that the land is being used, and this enhances claims to ownership by local communities.³⁵²

In the context of maps discussed in this chapter, the third level is manifestly “Westernized” and hence a post-contact mapmaking activity because it utilizes existing topographic maps. At the second level, the distinction between “technicians and practitioners” and the reference to native peoples being “trained as surveyors” suggest likewise. In contrast, the “outlines in the sand” and “maps on the ground” of the first level are redolent of traditional modes of production in the contact stage. As with modern maps intended as informal sketches, their historical equivalents are also the most difficult to document.

The extant maps of Charlton Island made by Crees between 1839 and 1846 (e.g., fig. 4.87), made in a context similar to the modern indigenous conservation maps, are good examples of the contact tradition. In contrast, the map of part of the Missouri River in North Dakota made by Sitting Rabbit in 1907 (fig. 4.58) is clearly an example of a postcontact document. Based on a published Missouri River Commission map, its content was in part determined by Orin G. Libby, who commissioned it on behalf of the State Historical Society of North Dakota.³⁵³

Most of the surviving maps made by Indians and Inuit were made at the request of Euro-Americans. Because most were solicited for specific purposes, usually to satisfy the need for geographical information, a large number have survived, though virtually all with enhancements. Almost all are on paper. Some have survived in archives since soon after they were made. Of these, those made for official presentation to royalty and their colonial representatives may—for reasons of aesthetics, intelligibility, or propriety—also be some of the most modified from the Indian originals. For example, the well-known extant versions of the Chickasaw map of the Southeast presented in 1723 to Francis Nicholson, governor of Carolina, contains two pictographic drawings: one small pointing hand and an armed Indian warrior leading a horse (fig. 4.38). Yet there are many empty spaces on the transcript, and one wonders if the original may have contained additional pictographs; perhaps omitted by the draftsman because that information was either incomprehensible or irrelevant to the English conception of the map as a statement of the strategic relations between themselves, allied Indians, the French colonists, and Indians allied with the French.

During the nineteenth century, Arctic exploration, the opening up of the interior and western parts of the continent, and the increasing scientific attention given to these

regions and their traditional peoples resulted in many official reports, semiofficial publications, and travel narratives. As the century progressed, publications were increasingly illustrated with line engravings (often woodcuts), including many examples of Indian and Inuit maps. These engravings tended to be small and simplified versions of the originals. The changes that could take place between originals and published versions can be seen by comparing the maps preserved in the National Anthropological Archives, Washington, D.C., with those published in the *Annual Reports of the Bureau of American Ethnology* in the late nineteenth century. The original maps include a set of three inscribed birchbarks given to Garrick Mallery about 1887 by Sapiel Selmo, a Passamaquoddy chief of the Pleasant River region in Maine. They are *wikhegan*, maps incorporating recent events and immediate intentions left as messages for persons expected to follow.³⁵⁴ The pencil markings on the originals, together with the circumstances of their presentation and collection, suggest they were specimens made on request. The published engravings lack some of the subtle detail found on the originals—including enhancements, modifications, and numbering of features.

An interesting insight into the acculturation process is provided by a Kiowa monthly calendar for the period August 1889 to July 1892. Drawn in colored inks on buckskin, it was copied from an earlier pencil version in a notebook (fig. 4.101). Each month was represented by a pictograph associated with an event. The pictograph for June 1891 is of a Euro-American and an Indian speaking to each other across a frame, on and above which are a number of small circles (fig. 4.102). It was the month in which a commission reached an agreement with the Caddos and Wichitas, near neighbors of the Kiowas to the southeast, for the sale of their reservation lands. The small circles symbolized the purchase money, and the frame divided into sections represents the allotments of land in the form of a gridded map.³⁵⁵

Based on the various levels of acculturation of the maps discussed in this chapter, it is possible to summarize three broad and inevitably overlapping stages in the develop-

352. Peter Poole, *Indigenous Peoples, Mapping and Biodiversity Conservation: An Analysis of Current Activities and Opportunities for Applying Geomatics Technologies* (Landover, Md.: Biodiversity Support Group, 1995), 6.

353. Thiessen, Wood, and Jones, “Sitting Rabbit 1907 Map,” 146–49 (note 230).

354. The three birchbark *wikhegan* in the National Anthropological Archives, Washington, D.C. (cat. 393, 431–33), were reproduced as line engravings in Mallery, “Picture-Writing,” 347–50 (figs. 456–58) (note 4).

355. James Mooney, “Calendar History of the Kiowa Indians,” in *Seventh Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, 1895–’96* (Washington, D.C.: United States Government Printing Office, 1898), 129–445, esp. 145, 373–79, and pl. LXXX.

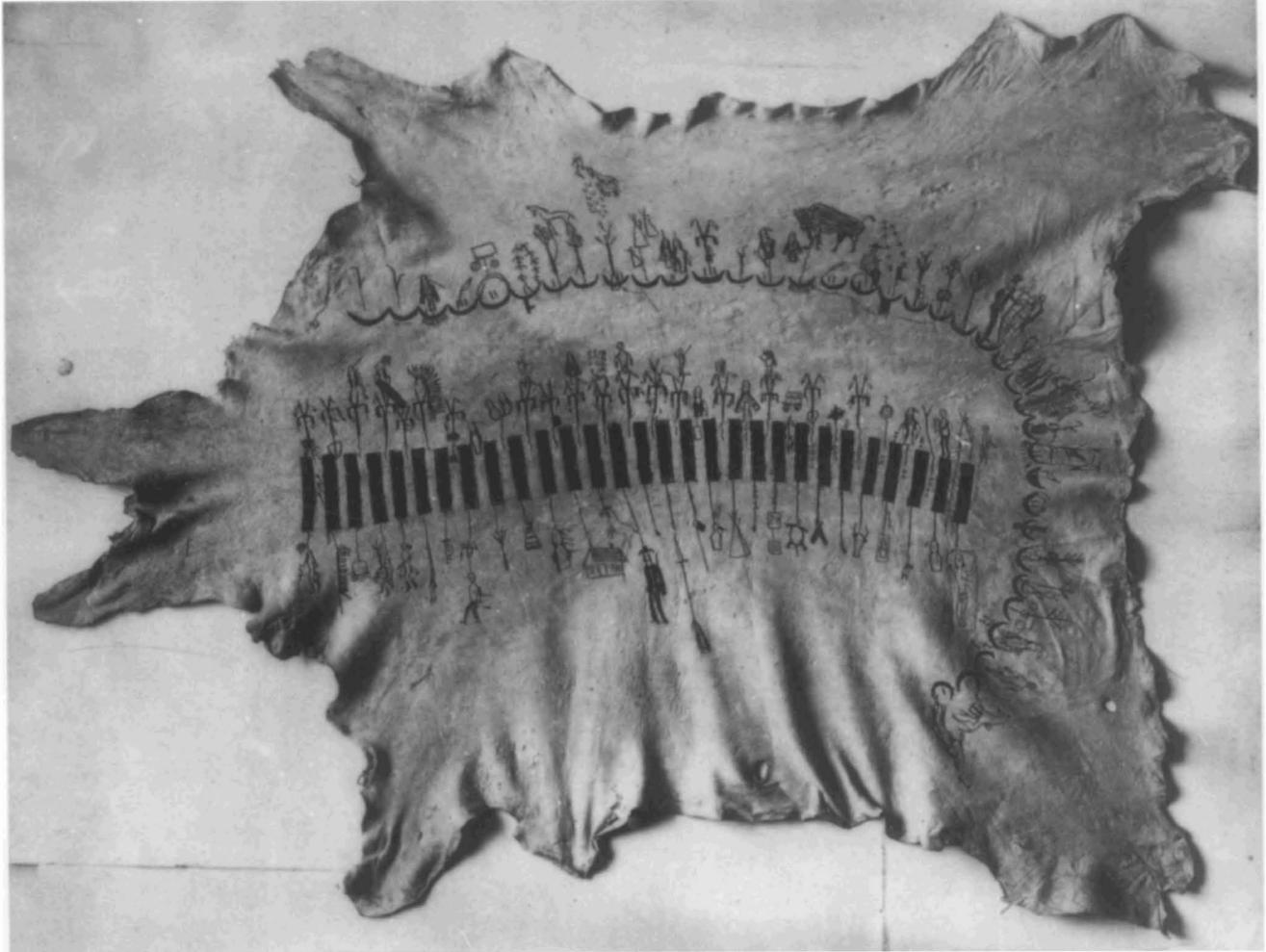
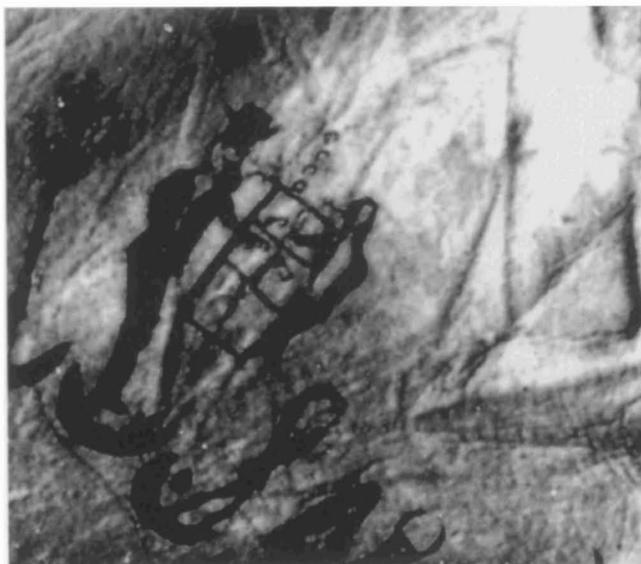


FIG. 4.101. KIOWA MONTHLY CALENDAR. This calendar was redrawn by Anko for James Mooney in 1892 in colored ink on buckskin from the original in pencil in a notebook. Only the photograph is extant.

Photograph courtesy of the National Anthropological Archives, Smithsonian Institution, Washington, D.C. (neg. no. 46.856).



ment of Amerindian cartography. The stages are described in table 4.1.

PHYSICAL ATTRIBUTES (MEDIA)

Although there are reports of native North American maps made throughout the continent, the media and techniques varied considerably. Some materials and meth-

FIG. 4.102. PICTOGRAPH FOR JUNE 1891 FROM KIOWA MONTHLY CALENDAR ON BUCKSKIN. In this detail from the upper right of figure 4.101, the frame symbolizes the sectional map used in negotiating a land sale. Although the calendar was drawn by Anko, a Kiowa, it was the sale of reservation lands by the neighboring Caddos and Wichitas that symbolized the month.

Photograph courtesy of the National Anthropological Archives, Smithsonian Institution, Washington, D.C. (neg. no. 46.856).

TABLE 4.1 Summary of Stages in the Development of Native North American Cartography

PRECONTACT STAGE	CONTACT STAGE	POSTCONTACT STAGE
<p><i>Period:</i> Predating even indirect European influence and beginning several thousand years earlier.</p> <p><i>Evidence:</i> Rock art and manmade structures, but both are problematic.</p> <p><i>Types of maps:</i> Celestial, many ultimately verifiable; terrestrial, more difficult to verify; cosmographical, most difficult to verify.</p> <p><i>Location:</i> In the field, particularly in the subarid West but including structures in the Mississippi and Ohio Valleys.</p> <p><i>Quantity:</i> Incalculable but probably numerous.</p> <p><i>Characteristics:</i> Truly indigenous in structure, style, and information content. Presumably changed through time as a consequence of migrations and cultural diffusions.</p> <p><i>Problems:</i> Discovering in the field; dating; verifying map function.</p>	<p><i>Period:</i> Mid-sixteenth and mid-seventeenth centuries along the northeastern and eastern littoral, in the St. Lawrence and lower Mississippi Valleys, and in the Southwest. Mid-seventeenth to mid-eighteenth century in the eastern interior. Mid-eighteenth to early nineteenth century in the northern and western interiors. Early to mid-nineteenth century in the Far West. Early to late nineteenth century in the Arctic fringe.</p> <p><i>Evidence:</i> Artifacts and accounts by explorers, traders, soldiers, missionaries, and early settlers.</p> <p><i>Types of maps:</i> Very few celestial and cosmographical, rather more terrestrial. Many on birchbark, some on skin, less frequently on hard animal tissue and in wampum. Ephemeral and modeled maps not extant.</p> <p><i>Locations:</i> Museums for artifacts. Early literature on discovery and exploration for accounts.</p> <p><i>Quantity:</i> Very few artifacts; numerous accounts.</p> <p><i>Characteristics:</i> Indigenous in structure and style but with an increasing tendency for content to be influenced by contact.</p> <p><i>Problems:</i> Paucity of artifacts and ambiguity of many accounts, especially earlier ones.</p>	<p><i>Period:</i> From the establishment of the first permanent Euro-American settlements, the development of regular trade and communications networks, and the beginnings of resource exploitation.</p> <p><i>Evidence:</i> Maps made to aid communication with Euro-Americans and to satisfy their requests for information about routes, strategic relationships, and resource locations.</p> <p><i>Types of maps:</i> Mainly terrestrial maps on paper in states ranging from entirely native drawn, via annotated originals, to Euro-American transcripts and printed versions.</p> <p><i>Locations:</i> Mainly in archives. Printed versions mainly in official publications.</p> <p><i>Quantity:</i> Numerous and from every part of North America.</p> <p><i>Characteristics:</i> Unquestionably maps but lacking many to most indigenous attributes.</p> <p><i>Problems:</i> Assessing the degree of acculturation and deciding how far each map's production, characteristics, and role afford evidence of native cartographic traditions.</p>

ods were virtually ubiquitous, whereas others were characteristic of particular regions.

Inscribing and modeling ephemeral maps on the ground—whether terrestrial or celestial—was a spontaneous and widespread enterprise; perhaps because of its novelty and utility in the eyes of European observers, it may have been overreported at the time of contact. Though the practice was regionally less widespread, some groups modeled maps in the course of shamanic performances. Restricted as to when and where they were performed, the cartographic components were usually only parts of more complex designs. Repeated over many generations, they tended to become stereotyped and often combined terrestrial, celestial, and cosmographic elements. Until the twentieth century, Euro-Americans rarely witnessed these ceremonial performances. When they did, as with John Smith's observations of Virginia Algonquian "conjurations" in 1607, the accounts tended to

stress forms and behavior rather than patterns, purpose, and meaning. The best-known examples of this kind of map modeling are in some of the dry sandpainting ceremonies in the Southwest, in which various colored sands depicted various celestial elements. In these rituals, the commonly cited examples of which relate to the Navajos, the sands were carefully sprinkled to create designs on a prepared background of natural colored sand and then destroyed.

Bark was perhaps the most distinctive of the map media, primarily but not exclusively that of the paper birch, *Betula papyrifera*. The tree grows in a broad belt extending from the East Coast between Maryland and Labrador to the Rocky Mountains in Montana and the lower Mackenzie River in the western Canadian Subarctic. The use of its bark as a map medium was most common in the eastern part of the belt, among the northeastern Indians and the easternmost bands of the Subarctic in the Up-

per Great Lakes region. Among most of these peoples, its use was reported from the early contact stage. For short-term use, it was ideally suited to inscribe or to mark with mixtures of grease and natural pigments (and later on with pencil). This made it a near perfect medium for instant pictographic messages.

Maps drawn on animal skin were almost certainly less common than ephemeral maps inscribed on the ground or relatively short-lived maps made on birchbark. They tended to be large and to be made for special purposes and occasions. Other media were more localized or atypical. Throughout much of northeastern North America, mnemonic devices known as wampum belts were made from colored shells shaped into beads and woven into patterns symbolizing both geopolitical and spatial relationships. It is perhaps in the Subarctic and Arctic that the most specialized forms of materials are reported. In the eastern Subarctic, the scapulae of mammals have been used in a form of divination known as scapulimancy, which was often cartographic. Among the Ammassalik Eskimos on the east coast of Greenland, maps in bas-relief or in three dimensions were carved on driftwood to represent not only the complex fjord coastline but also the shape of the mountains along the coast. The Inuit also have a tradition of engraving walrus tusk ivory with graphics, although no premodern examples appear to have been maps. Elsewhere, although maps were occasionally painted on the trunks of blazed trees, wooden boards were rarely employed, even after Europeans introduced sawn boards. Perhaps making maps on paper was the most convenient equivalent of doing so on the ground or on birchbark. Furthermore, perhaps the relative permanence afforded by painting or engraving maps on wood was not considered necessary.

STRUCTURE

The geometric structure of Indian and Inuit maps has received very little attention. Without knowing a culture's underlying concepts of how space is ordered and represented, it is impossible for another culture using different spatial structures to interpret indigenous maps. There is no evidence that the formalized geometries of the West had any counterpart in native North America before the late postcontact stage, and there is always the danger of imposing Western geometric concepts on indigenous representations. Such Western concepts include metric scale, standard units of measure, standard orientation, and systematic projection.

In North America there was little need for such regularization of distance and direction. Land and water distances were experiential itinerary measures; days' journeys, overnight stops, distances between pauses, the dis-

tance over which a gunshot could be heard. Without exception, these were relative. Factors influencing them included season of the year, environmental conditions, mode and purpose of travel, physique and skills of the weakest member or horse, and previous experience of the route.

Nevertheless, geometric regularities are certainly recognized in cosmographical concepts such as the fundamental axes of the universe, the cardinal directions, and the underlying importance of the circle. The Pawnee and Lakota Sioux notions of the heavens' mirroring the earth are related: Grieder's third and final cultural wave in his genetic explanation of precontact art was characterized by a fundamental belief that events on earth took on meaning only by reflection from the heavens.³⁵⁶

Working with modern Navajos (descendants of third wave peoples), Rik Pinxten recognized that their spatial representations are rooted in three basic notions: volume/plane, movement, and dimension. These are implicit in many secondary spatial notions: near/separate/contiguous, part/whole, boundary, in/out, center/periphery, open/closed, overlapping, convergence/divergence, order and succession, front/back, up/down, left/right, and next to.³⁵⁷ All the secondary notions are dimensionless, involving neither a linear metric nor a system of angular measure, and include many topological properties that are retained even when the structure undergoes deformation.

Virtually all Indian and Inuit maps are structured topologically in the informal sense. Exceptions occurred after Euro-American acculturation or when cosmographical locations took precedence over geography. The Black Hills component of the map made by Amos Bad Heart Bull sometime between 1891 and 1913 (fig. 4.57) is a good example. The placing of Devils Tower within the Black Hills may have been topologically incorrect, but it was entirely consistent with Lakota belief that the terrestrial world was a mere mirror of the celestial. Because their theology overrode topography, conceptual relocations of fixed terrestrial features were sometimes necessary.

Networks of rivers and trails, topologically structured, were included because they functioned as routes and, occasionally, as boundaries. But in the absence of graticules and grids, they also served as the structural base on which it was possible to mentally situate small areal and nodal features. For example, without its rivers and paths, not only would the Chickasaw map of 1723 (fig. 4.38) have had significantly less information content, but it would have been virtually uninterpretable by outsiders, especially as originally drawn, before names were added.

356. Grieder, *Origins of Pre-Columbian Art*, 101 (note 49).

357. Rik Pinxten, *Towards a Navajo Indian Geometry* (Ghent, Belgium: Communication and Cognition, 1987), 16–23.

The ground areas represented on terrestrial maps ranged from a few hectares to well over a million square kilometers.³⁵⁸ Most small-area maps were based on the direct once-only or lifetime experience of one individual or small group. In contrast, making large-area maps must have involved integrating information provided by many, perhaps over several generations, and almost certainly mediated by tradition.³⁵⁹ Terrestrial maps have many kinds of networks, but it is useful to recognize a hierarchy from very simple to highly complex: single-path networks, single-branch networks, multibranch networks, and circuit networks (fig. 4.103).

Single-path maps may be the most common of the four types (fig. 4.103*a*). They usually represent routes but vary enormously in style, complexity, and information content. The simpler ones were almost all made in the course of indicating specific routes, especially in the postcontact stage, when Indians frequently served Euro-Americans as geographical informants and field guides. The canoe-route map made in 1892 by the Chipewyan Andrew for the geologist J. B. Tyrrell is a good example (fig. 4.84). The information content of single-path maps is essentially that of oral itineraries.

Not all single-path maps were of simple routes. Though beltlike rather than linear in overall form, the Southern Ojibwa Mide migration charts (e.g., fig. 4.23) were in essence maps of single-path, one-way migration (or diffusion) routes. Yet their pictographic complexity and mythical information content is in marked contrast to the simple birchbark message map found in 1841 on the Ottawa River–Lake Huron watershed (fig. 4.24).

Single-branch networks add one or more branches to a single path (fig. 4.103*b*). The branches were included either to show alternative routes or to position other information on the map more clearly. An example is a map of the lower Colorado River traced on the ground by a Yuman (Quechan) Indian for Lieutenant Amiel Weeks Whipple in February 1854. It was made so that the Yuman could give the positions as well as names of various Indian groups.³⁶⁰ Because this stretch of the river flows through semiarid scrub, tributaries are few, widely spaced, and hence effective for positively locating other features. Presumably this map was very similar to the map of the same stretch of the river reported to have been made for Alarcón by a Halchidhoma (near neighbors of the Yumans) more than three hundred years before.

Multibranch networks include two or more single-branch networks as discrete but adjacent components (fig. 4.103*c*). Most large-area maps of large river systems (e.g., figs. 4.38, 4.59, 4.66, 4.67, 4.71, 4.78, 4.81, and 4.83) represent networks of this type.

Circuit networks form the most complex category (fig. 4.103*d*); in them it is possible to pass between any two

points in the circuit by several alternative routes. They are found in Indian route systems composed entirely of land paths, or canoeable rivers with transwatershed portages, or combinations of the two. Of such networks represented on maps, only a small proportion were composed entirely of land paths; for example, the Alabama headman's map of the locations of ten Chickasaw villages, one Natchez village, and the paths between them (fig. 4.40). Much more common are circuit networks consisting of a combination of land paths, navigable rivers, and transwatershed portages. Of this type, the Indian map of New Mexico transcribed in 1602 (fig. 4.59), with its combination of intersecting *rios* and *caminos*, is a good example.

There are a few indications of attempts to “scale” simple representations—such as single-path and single-branch networks—according to travel time. The case has already been made that this was so for the Cayuga-Susquehanna single-branch network map of 1683 of the Susquehanna River (figs. 4.18 and 4.19). Examples may have been more common among single-path maps, but the difficulty of establishing sufficient reliable referents along most of these, coupled with lack of knowledge about travel times (actual, average, upstream, downstream, by season, and so forth) virtually excludes the possibility of proof.

The structure of Indian and Inuit maps was also influenced by the shape of the available media, as in the case of the map of Lake Nipigon made on paper by Ojibwa Indians about 1859 (figs. 4.85 and 4.86). Though less immediately apparent, the representation of a complex single-branch network on the Iowa map of 1837 (fig. 4.67) is distorted to a remarkable extent by the constraints of the paper it was drawn on. Here the east bank tributaries of the upper Mississippi River (mainly in what are now Wisconsin and northwestern Illinois) occupy almost as much space as those on the west bank (draining

358. Of the examples of terrestrial maps reproduced in this chapter, figures 4.59, 4.66, 4.67, 4.71, 4.79, 4.81, 4.83, and especially 4.38 are the large-area maps.

359. Although made over a period of more than 150 years, figures 4.79, 4.81, and 4.83 may be part of such a tradition. If so, it was a post-contact tradition much influenced by the fur trade, which involved Indians in longer and more frequent journeys, gave rise to new contacts between Indians (and hence information flows), opened up new riverine routes, and created a demand for geographical information almost as great as for furs themselves.

360. Whipple made a copy of the ground map in a notebook; Lieutenant W. Whipple, untitled map in pencil on paper, February 1854, Notebook 20, Pacific Railroad Survey on 35 Parallel, Mississippi River to Pacific Ocean, 15 April 1853 to 22 March 1854, Oklahoma Historical Society, Oklahoma City. The most accessible published version is a line drawing: “Yuma map of Rio Colorado, with the names and location of tribes within its valley,” in *Explorations and Surveys*, 16 (note 183).

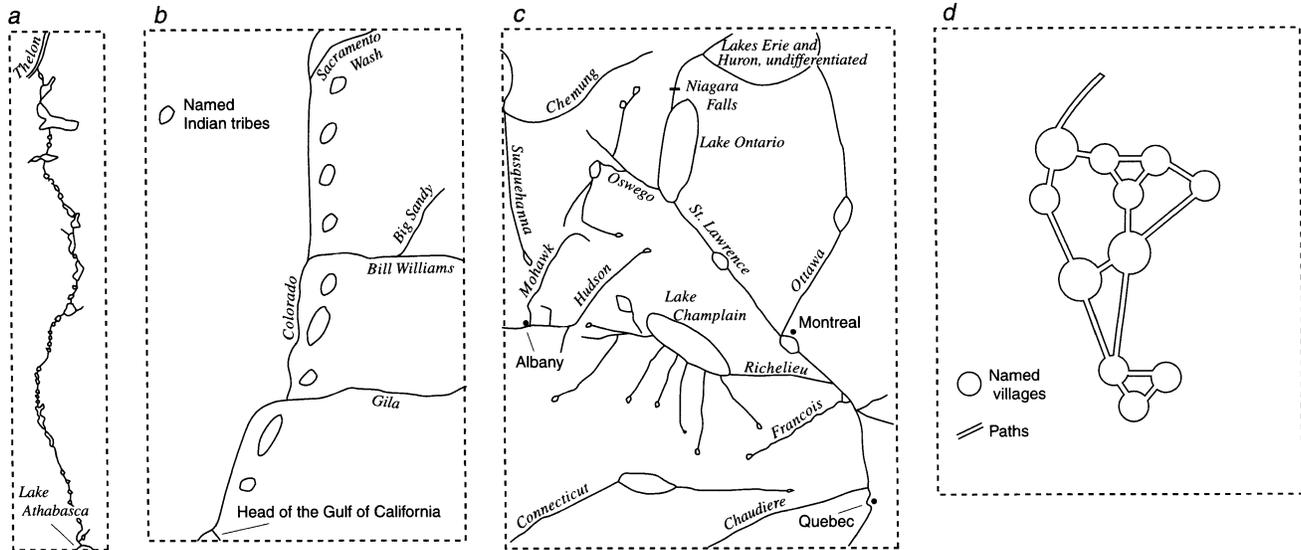


FIG. 4.103. FOUR TYPES OF NETWORKS ILLUSTRATED BY INDIAN MAPS. The single-path network (a) is illustrated by the 1892 Chipewyan map of the canoe route from Lake Athabasca to the Thelon River—more than seven days' travel involving forty-five portages (fig. 4.84). The single-branch network (b) is depicted by the Yuman map (1854) of the lower Colorado River and tributaries showing named Indian groups

(see notes 183 and 360). In c, the multibranch network is based on a map of parts of the St. Lawrence, Susquehanna, Hudson, and Connecticut drainage systems, anonymous (Indian?), 1696 or 1697 (fig. 4.20). The circuit network shown in d is derived from the map by the Captain of Pakana (Alabama headman) showing the paths between their villages in what is now northeastern Mississippi (1737) (fig. 4.40).

most of Minnesota, Iowa, South Dakota, Nebraska, and northern Kansas, as well as part of Missouri) (fig. 4.68).

In the eighteenth and nineteenth centuries, Inuit and Subarctic Indians tended to represent the long and geometrically complex coastlines north from Fort Churchill and east around the Fury and Hecla Strait as essentially straight, though often exaggerating bays, estuaries, headlands, and offshore islands—significant features for travel, hunting, fishing, and other vital tasks. Inuit did represent parts of this coastline at a larger scale and in remarkable detail (e.g., fig. 4.92). However, the traditional way of indicating the crucial boundary between land and sea was an essentially straight line with minimal ornamentation. They may have been making a traditional cartographic generalization very similar to that of Blackfeet who, soon after contact at least, placed a smooth boundary on maps to indicate the transition zone between their two worlds; forest and grassland (figs. 4.62 and 4.80). Likewise, the boundary between forest and tundra was commonly placed on maps by Subarctic Indians soon after contact in the eighteenth century.

No one factor determined the geometry and structure of Indian and Inuit maps. Although they differed from modern European maps in deriving nothing from absolute linear metrics and having no equivalents of either grid or graticule, pattern and shape were not random. The geometry of a specific map is likely to have been influenced by several interrelating factors, for the most part hidden.

INFORMATION CONTENT

In their information content, native North American maps were unlike either topographic or thematic maps made in the Euro-American tradition.³⁶¹ Within the area mapped, no attempt was made to represent consistently every occurrence of a range of different phenomena. Even though most native North Americans were well informed about their own territories and the wider geography of their part of the continent, their terrestrial maps were not intended to be compendiums of that information. Each contained sufficient information to achieve its purpose, and the purpose was always circumscribed. The underlying principle was parsimony in selecting. It was assumed that those a particular map was intended for needed it to supplement what they already knew or to remind them of what they might forget. Supplementing was the dominant role of terrestrial maps, whereas cosmographic and celestial maps served to remind. A map was not a spatially organized cornucopia of information from which sundry groups or individuals could draw according to their needs. The selection of information could be based on form, function, magnitude, cultural significance, mythical and religious attributes, or some combination of these.

Awareness of differences between indigenous and Euro-American mapping practices emerged slowly. Dur-

361. Several of the concepts in this section were introduced and developed in more detail in Lewis, "Metrics, Geometries, Signs, and Language" (note 2).

ing the sixteenth century and well into the seventeenth, the consequences of these differences for explorers, traders, and early settlers were not great. Later, especially during the Enlightenment, the mores and standards of accuracy of European cartography were tacitly assumed to hold for native maps as well. For more than three hundred years, and persisting until recently, Euro-Americans “read” native maps for their information content with little or no appreciation of these fundamental differences.

The selection and emphasis of natural physical features—hydrological networks, coastlines, key sites, and watersheds—were directly related to their significance within the context of the map’s communication role. Rarely were they a function of physical magnitude. Rivers used regularly as routeways were often represented to the exclusion of rivers that were their equivalents in other respects. The map of the Susquehanna River obtained by Robert Livingston in 1683 (figs. 4.18 and 4.19) omits all east bank tributaries, one major west bank tributary (the Juniata), and the south shore of Lake Ontario. Because the circumstances in which the map was made are fairly well documented, these omissions are explainable as consequences of political and strategic factors.

Conversely, small but significant features were often exaggerated on maps. For example, the locally bold eastern edge of the Coteau des Prairies in northeastern South Dakota was more than a locally prominent physiographic feature. It marked the boundary between different environments, resource bases, and native groupings. It is represented as a large mountain range on the engraved version of the Indian “stag skin” map, the original of which was given to Lahontan in 1688–89 (fig. 4.60). This alpine image may in part have been a consequence of the transcribing and engraving processes. Similarly, although the amount of modification in its transcribing and mosaicking is unknown, La Vérendrye’s composite map of 1729 (figs. 4.76 and 4.77) shows a solitary “Rivière au Vermillon” in a region of many rivers and the “montagne de pierre brillanté” in an otherwise relatively empty portion of the map. Both features were exceptional and culturally endowed but neither large or spectacular.

The range of phenomena found in all known examples of Indian and Inuit maps is remarkably diverse. Environmental information was normally included for strategic reasons, to demonstrate spatial relations, or because it was associated with natural resources. The “woods edge” on Chipewyan maps was not an abstract biogeographical statement but a signal that it had strategic significance for travel, subsistence, and even survival (see figs. 4.79–4.83). Amos Bad Heart Bull’s distinction between valley bottoms, benchlands, escarpments, and buttes brought out the essential space relations of the western Great Plains (fig. 4.56), which half a century or more later were to be classified by ecologists as ecosystems and by rural sociologists as sutlands and yonlands. Critical resource

locations were indicated on many maps. The earliest were the widely spaced *salinas* on Miguel’s map of 1602 (fig. 4.59). Salt was a vital resource on the central and southern Great Plains. Exactly two hundred years later, Ki oocus’s map of the northwestern Great Plains (fig. 4.62) marked a similarly vital resource: berries. Berry sites, however, were shown only on marked trails, with no indication of their presence or absence in the vast intervening spaces.

Mammals were a somewhat more localized food resource than edible plants. Hence favorable locations were represented on maps with even greater frequency. John Tinker’s 1662 transcript of an Indian map of what had formerly been Pequot territory (fig. 4.15) has an associated text indicating a neck of country into which the Indians had driven deer. Examples of animal resources on maps include the series of Cree maps made between 1839 and 1846 to show the dispersion of beavers after their introduction to Charlton Island (fig. 4.87); several nineteenth-century Plains Indian pictorial maps representing bison moving along trails (figs. 4.54 and 4.58); and the Aivilingmiut map of musk ox hunting journeys to the west of Roes Welcome Sound on which clusters of dots indicate the locations and relative sizes of the herds (fig. 4.91).

Cultural information almost certainly exceeds that relating to the natural world on Indian and Inuit maps: individuals and groups of people; dwellings and settlements; routes and journeys; hunting, trapping, and fishing activities; clearings and fields; domesticated animals; battles, powwows, and councils; and very occasionally, boundaries.

The representation of boundaries merits consideration in view of the widespread opinion that native North Americans had no concept of landownership or finite territorial limits. On the relatively rare occasions when Indians did represent ownership boundaries, they were usually being proposed or negotiated and were not *de facto*. An early example is the 1666 or 1668 map delimiting a rectangular area of land that was available for sale to the Plymouth Colony (fig. 4.16). Less well known were the bark and stone maps produced on consecutive days in 1805 by a Mississauga spokesman. Both of these showed boundaries of lands they were willing to cede but, very unusually, did so in the context of the Indians’ understanding of the boundaries of land sold a generation earlier. Mississauga leaders, at least, had thus inherited an acculturated but orally transmitted tradition of boundaries of landownership that they were able to record when needed.

THE INDIGENOUS ROLES OF MAPS

Maps were made, used, and in some cases preserved for a variety of secular and spiritual purposes, though the dis-

inction between them was never sharp. Most of the secular roles fall into one of three functional categories: leaving messages; instructing, collating, and planning; and commemorating events.

Message maps were almost exclusively characteristic of the Northeast and adjacent parts of the eastern Subarctic. Most were made on birchbark and left at strategic locations to inform groups expected to arrive soon (e.g., figs. 4.24 and 4.25). Others were made on the blazed trunks of trees and seem usually to have been associated with war (e.g., figs. 4.27 and 4.28). Although the Indians of these regions are reported to have made maps on birchbark from early contact, accounts of their use as messages came later.³⁶² The rivalry between English and French interests, mainly in connection with the fur trade, stimulated Indian travel and migration, particularly among the maize-cultivating, hitherto relatively sedentary Indians around the eastern Great Lakes. New alignments, new tensions, new economies, new territorial ranges, and new routes emerged. In this new Indian world there would have been greater need for messages, and it could well be that the somewhat formal maps on birchbark as reported in the late seventeenth and early eighteenth centuries were adapted for more immediate utilitarian use.³⁶³ Whether message maps were made spontaneously by Indians in the course of traditional hunting trips, seasonal migrations, and occasional crises before contact with Europeans is one of the most important and intriguing questions facing future historians of North American traditional cartography.

The use of maps in planning, gathering information, and instruction was usually connected with war or travel beyond normal territorial limits. Although much of the evidence is from early contact stages, the direct and indirect consequences of contact may almost immediately have increased their use. Samuel de Champlain's generalized account of St. Lawrence Valley Indians using plans made with sticks in preparing battle orders incorporated both planning and instruction. The chiefs placed sticks in a predetermined pattern to indicate battle positions; the warriors then took note and repeatedly practiced keeping their intended ranks. Far more impressive was the modeling on a beach by a Nootka of a village some 150 kilometers away that was about to be attacked. In that incident, mapping, planning, and learning involved considerable interaction between the participants. Much more pedagogic was the way Comanche elders in western Texas are reported to have used ephemeral maps in briefing young braves about routes to be taken on long-distance raids far beyond the limits of their own territory.

The facility with which Indians and Inuit extended Europeans' maps of rivers and coastlines beyond the limits of the latter's explorations is well documented.³⁶⁴ It may have been one of the procedures whereby Indians gath-

ered geographical information to make maps of vast areas extending far beyond the limits of their own experience (e.g., fig. 4.38). For example, in 1861, on the lower Moisie River, eastern Quebec, a map was made on birchbark to help exchange information about the route to the source of the river and beyond (fig. 4.69). It was used by a new pair of Indian guides to instruct an existing pair who had reached the limits of their area of competence.

Recording former events with maps seems to have been common, particularly but not exclusively among Plains Indians. The oldest extant example is probably the route of a Quapaw war party to a successful battle against enemy Indians as incorporated in a painted bison hide dating from the mid-eighteenth century (plate 6). Its artistic quality and the durability of the medium chosen suggest that it was made as a symbolic record of this important event (or perhaps a sequence of similar events) and intended for posterity. An example from the nineteenth century, Oto Gero-Schunu-Wy-Ha's map of 1825, embraces a huge area and traces, among other events, the route of a war party in the upper Arkansas Valley (figs. 4.64, 4.65, and 4.66). Examples of maps made by non-Plains Indians to record events include many of the birchbark message maps from the Northeast (fig. 4.26), one-time return-journey maps of the kind made by the Chilkat chief Kohklux seventeen years after the event (figs. 4.50 and 4.51), and maps depicting sequences of annual hunting trips, exemplified by that made about 1898 by the Aivilingmiut Meliki (fig. 4.91). A remarkable attempt to present spatial change through time was the sequence of eight Cree maps of Charlton Island, made between 1839 and 1846 to plot the dispersion of newly introduced beavers (fig. 4.87).

Maps made largely for spiritual and metaphysical purposes were almost certainly present long before contact with Europeans and were least affected by Western thought. The role of these representations, which articulated views of the creation of the world and cosmos, was primarily to record traditions and assist in rituals. Many were ephemeral, made in the course of shamanic ceremonies and deliberately destroyed thereafter.³⁶⁵ Artifacts

362. Among the earliest reported examples is that found in 1775 in northern Maine in the course of Benedict Arnold's Revolutionary War expedition against the British garrison at Quebec (Henry, "Campaign against Quebec" [note 107]).

363. For a generalized account of these, see pp. 84–86.

364. For example, the extension southward by Pawtuckets or Massachusetts in 1605 of the newly explored coast of what was to become Maine and New Hampshire as drawn for them by Samuel de Champlain (p. 68); likewise, the Netsilik's extension in 1830 of John Ross's map of the land between Repulse Bay and Prince Regent Inlet (plate 8).

365. For example, though not all Southwest sandpainting (dry painting) incorporated maps, virtually all were systematically destroyed at the end of the ceremony in which they were made. Blessing gives another example, departure from which had importance for the ultimate recog-

tual examples were closely guarded and concealed by their keepers.³⁶⁶ On the rare occasions when they were seen by Europeans, the only surviving evidence is that mediated by these observers.³⁶⁷

During the period of acculturation, problems of interpretation compounded. When Euro-Americans began to witness ceremonies and collect artifacts toward the end of the nineteenth century, it was possible only because the native belief systems they were associated with were in terminal decline. By then native informants were not as well informed as the initiates of previous generations. Moreover, traditional artifacts were sometimes replicated commercially for Euro-Americans, who valued them as works of art but lacked the ethnographic knowledge to understand them. The incorporation in Navajo commercial art of celestial patterns from sandpainting is a good example (fig. 4.47). In addition, Native American oral cosmographies were sometimes represented by Western maps. One example is a line map by the California anthropologist T. T. Waterman showing “the Yurok idea of the world.” It shows northern California at the center, surrounded by an ocean, bounded in turn by “sky its edge.” Beyond that is an “ocean of pitch” within which is “salmon’s home,” and beyond that is “boundary of universe.”³⁶⁸ However, there is no evidence that this map was derived from a Yurok artifact or, indeed, that the Yuroks would have either understood or agreed with it in its published form.

Despite difficulties in its interpretation, rock art provides important evidence of indigenous cosmographical representation, much of it in far western North America. These were for the most part the creations of shamans and their initiates in ritual cults, depicting the culturally conditioned visions or hallucinations they experienced during altered states of consciousness.³⁶⁹ Using ethnographic evidence of early contact cultures, Grieder concluded that in the third wave cultures characteristic of much of North America at contact the circle symbolized the celestial world in plan, and likewise the square represented the terrestrial world (both known and unknown). The concentric design of circle and square (mandala) symbolized the whole cosmos in plan.³⁷⁰ If so, these were microcosmic analogues or “psychocosmograms” akin to those recognized, for example, in South Asian cartography.³⁷¹ It would be wrong, however, to conclude that all or even most simple geometrical shapes in rock art were abstract symbols for terrestrial, celestial, or cosmographic worlds. Some may have symbolized nothing remotely cartographic. Some may have been plans of circular structures such as camps or lodges, which themselves often symbolized worlds by their shape and orientation. For example, the circular sun dance lodge of the historic Plains Indians, the Oglala Sioux tipi, and the hogan of the Navajos were thought to be replicas of the universe.³⁷²

Furthermore, symbols were mutable. Before third wave peoples used the circle to symbolize the sky, it had for millennia symbolized the earth.³⁷³ Other simple geometric shapes also symbolized worlds. For example, in much of North America at the time of contact, the cross was identified with the whole universe.³⁷⁴ When such symbols appear in rock art there is very little basis for assuming that they were made to represent worlds in plan and even less for distinguishing between the symbolization of the terrestrial, celestial, and cosmographic worlds, particularly when the panels have not been dated or linked conclusively with cultures whose worldviews have been independently reconstructed.

Further progress in interpreting the purpose and meaning of these forms may lead to new insights, and there may well be far more representations of celestial events and star patterns in rock art than hitherto suspected. The now respected and dynamic field of archaeoastronomy, involving astronomers, archaeologists, and cultural anthropologists (as well as many enthusiastic amateur fieldworkers), is likely to make theoretical strides in this direction, although some of the early speculative claims will

and interpretation of Mide migration charts. A Mide priest who died in 1946 left an “amazing accumulation” of birchbarks and pictographic materials transcribed on paper and cardboard. They were saved by intervention as they “were about to be burned as is the custom if no trustworthy successor was available into whose hands the material would ordinarily pass.” Fred K. Blessing, “Birchbark Mide Scrolls from Minnesota,” *Minnesota Archaeologist* 25 (1963): 90–142, esp. 100.

366. For example, the Southern Ojibwa Mide migration charts. As early as 1850 George Copway described the way birchbark scrolls were preserved and from time to time replaced by replication. Examples of the charts were, however, essentially unknown to non-natives until the early twentieth century. The earliest ones referred to by Selwyn Dewdney were collected in 1903 (Dewdney, *Sacred Scrolls* [note 99]). The first serious description was not published until 1963 (Blessing, “Birchbark Mide Scrolls”). It was not until 1975 that Dewdney, piecing together scraps of ethnohistory and ethnography, convincingly interpreted them as maps.

367. An example is the circular cosmography performed at a ceremony in 1607 in which Virginia Algonquians expressed their worldview behaviorally and showed where they imagined the home of their English captives to be, as witnessed and described by John Smith (figs. 4.11, 4.12, and 4.14).

368. T. T. Waterman, *Yurok Geography*, University of California Publications in American Archaeology and Ethnology, vol. 16, no. 5 (Berkeley: University of California Press, 1920), 192 (fig. 1).

369. Whitley, “Shamanism and Rock Art,” 89 (note 47).

370. Grieder, *Origins of Pre-Columbian Art*, 111 and 129 (note 49).

371. Joseph E. Schwartzberg, “Cosmographical Mapping,” in *The History of Cartography*, ed. J. B. Harley and David Woodward (Chicago: University of Chicago Press, 1987–), vol. 2.1 (1992), 332–87, esp. 379–82.

372. See note 12 and Åke Hultkrantz, *The Religions of the American Indians*, trans. Monica Setterwall (Berkeley: University of California Press, 1979), 28.

373. Grieder, *Origins of Pre-Columbian Art*, 100 (note 49).

374. Hultkrantz, *Religions*, 28 (note 372).

be found to be spurious.³⁷⁵ Conversely, conclusive evidence for cosmographic maps will remain elusive, except perhaps for late precontact cultures for which pertinent ethnographic evidence is available from the contact period.

Like Europeans, native North Americans made and used maps to make sense of the world beyond that of direct experience: the conjectural and imagined cosmographical worlds of shamans. They had done so for generations, centuries, probably even millennia before contact. Like Europeans, they also made and used maps to communicate spatially arranged information about parts and aspects of the terrestrial world. Those who

knew by experience—travelers, hunters, war chiefs, and guides—communicated with those who needed to know.

In contrast, native North Americans differed from Europeans in not having used maps to divide their terrestrial worlds into finite areas comparable to the Europeans' states, territories, townships, and properties. In this respect, at least, maps made by native North Americans had never been expressions of secular power and were not to be so until well after contact.

375. Within the Americas, since the mid-1970s the astronomer Anthony F. Aveni of Colgate University has been largely responsible for furthering this field.