

Topographical Coordinates in Eipo and Dene

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Introduction

- [...] until recently, there has been relatively little scholarly research in how landscape is conceptualized, that is, how a continuous land surface, a landscape, becomes cognitive entities, and how those entities are classified and represented in language and thought.
(Mark et al. 2011: 1; emphasis original)

Aim I

- The project addresses questions of universality and the culture-dependence of spatial thinking in societies that codify spatial knowledge almost exclusively by means of spoken language and joint action.
- These questions are approached by comparing spatial languages and practices in two independent non-literate societies, Eipo and Dene.

Aim II

- Mental models based on gestalt principles.
- Reconstruct mental models of large-scale orientation/navigation processes including landmarks, toponyms, distances, scale, scope, frames of reference, and figure-ground asymmetries (distributed cognition).

Outline

- Mental models as cognitive maps
- Landmarks as toponyms
- Dead reckoning systems based on mental triangulation and gestalt principles
- Data sources: ethnogrammars, ethnographic film recordings, interviews, myths, and stories

Questions

- How does navigation on land work in the cultures under survey?
- On what external parameters are selected cognitive maps formed?

Hypothesis I

- Spatial orientation and navigation is represented as mental models, and these mental models are strategic foci to and from which the person moves or travels (Hutchins 1983, 1996). These models are used as proximate course-maintaining devices in the encoding of figure-ground asymmetries (Thiering 2011).

Hypothesis II

- Non-linguistic information as cultural practice and joint action has its impact upon spatial thinking and mental models.
- Topographical information of the environment is represented as mental models constituting gestalt-like representations.

Quote

- Descriptions of space in language must rest on two kinds of knowledge. The first is based on models (maps, representations) which people construct to guide spatial behavior. The second consist of a linguistic symbol-system that allows the models to be shared within a community of discourse. (Siegel & White 1975: 11)

Cognitive Maps I

- Cognitive maps of geographic spatial information represent geometric information, i.e., a layout of differentiated topography of a space (Kitchin & Blades 2002).

Cognitive Maps II

- A cognitive map places a mental copy of each experienced landmark into a system that preserves metric information about straight-line distances and directions of landmarks relative to one another.

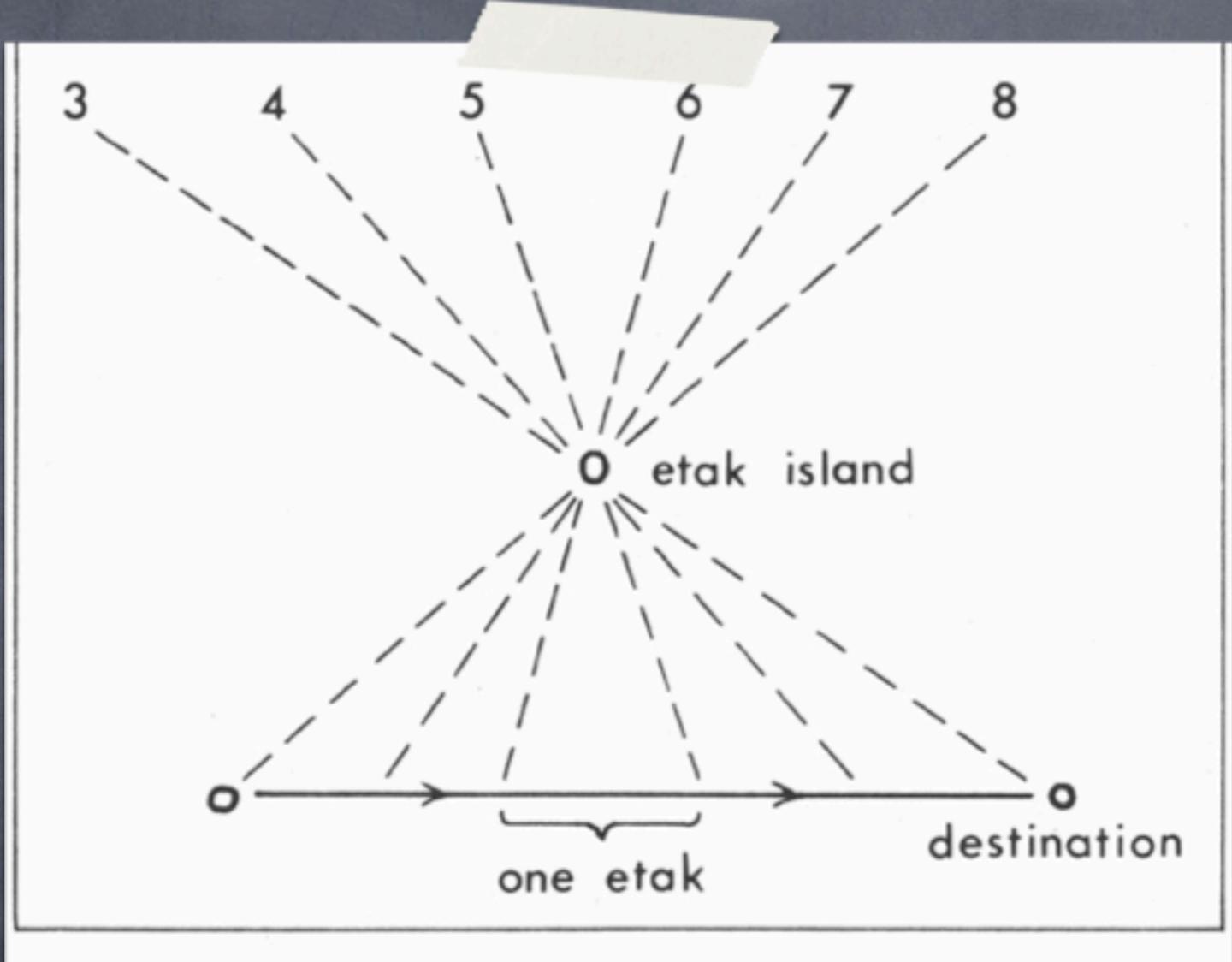
Cognitive Maps of Dead Reckoning Systems I

- Orientation processes on sea and on land based on mental triangulation and gestalt principles.

Cognitive Maps of Dead Reckoning Systems II

- Navigating without instruments implies keeping distance and heading based on wind directions, banks, reefs, tides, birds, possible visible islands, but mostly on etak systems (Hutchins 1996: 87–88; see also Gladwin 1970).





Cognitive Maps of Dead Reckoning Systems III

- Two types of spatial representation construed by navigation, which refers to travel between places in the environment that cannot be simultaneously seen: One type is a cognitive map or survey representation of space, the other is a route representation.

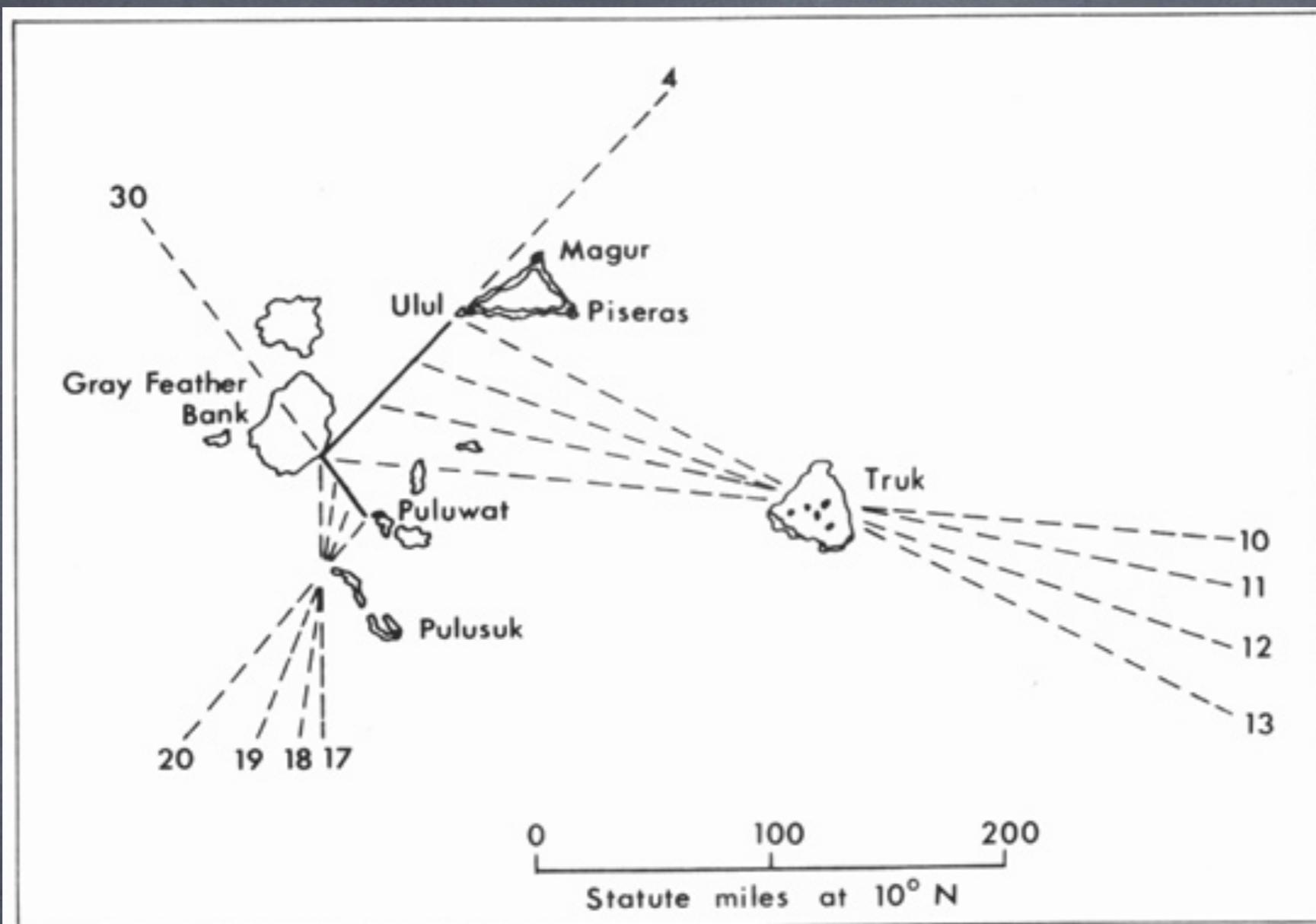


FIGURE 4
Truk as Etak Island for Ruat to Ulul

Knowledge Systems: Landmarks

- Landmarks are unique configurations of perceptual events (Col et al. 2012). They identify specific geographical locations based on perceived attributes such as location, size, scope, scale, magnitude, identity, time, colour, function.

Eipo

(Irian Jaya, West Papua New Guinea)





Eipo Environment

Semantic Variation of Mountain as Landmark in Eipo

- a. *motokwe kon dinib'mak* 'they go round the ridge of the mountain (in order to avoid to climb it)' (1442)
- b. *motokwe dok* 'flank of a mountain' (1502)
- c. *motokwe dub* 'top of a mountain' (1592/2)
- d. *motokwe marman* 'transverse (path) under a cliff' (3867)
- e. *motokwe kon* 'mountain top ridge' (4087/4) (*sin* 'mountain top', 'high plateau')
- f. *motokwe yim* 'mountain (ridge edge)' (4087/7) (*bisik wamumna* 'ridge')

Semantic Variation of Water in Eipo

- a. *mek burwe* 'head water region'
- b. *mek youkwetam* 'downstream' (3894/31), 'towards the foothills'
- c. *mek lu* 'water surface' (3623/2) (*lu* = 'even', 'flat', 'down', 'low')
- d. *mek amwe* 'bed/bottom of a river, a lake'
- e. *meke ebrarik* 'water', 'rivers split up/join', 'river junction'

Deictic Expressions in Landmark Orientation in Eipo

- a. *da-* [+ NP] 'here' (in a wider area around the speaker and hearer)
- b. *dei-* [+ NP] 'very far up there' (across the mountains) vs. *fera* = 'far way', as opposed to *dam'* = 'close by', 'short (way)'
- c. *dou-* [+ NP] 'very far down there' ('very far down the valley')
- d. *dor-* [+ NP] 'very far across the ridges in the next valley'; 'at same level or lower than own position'
- e. *der-* [+ NP] 'very far across the ridge in the next valley'; 'higher than own position' (Heeschen 1998: 144)





Dene Environment

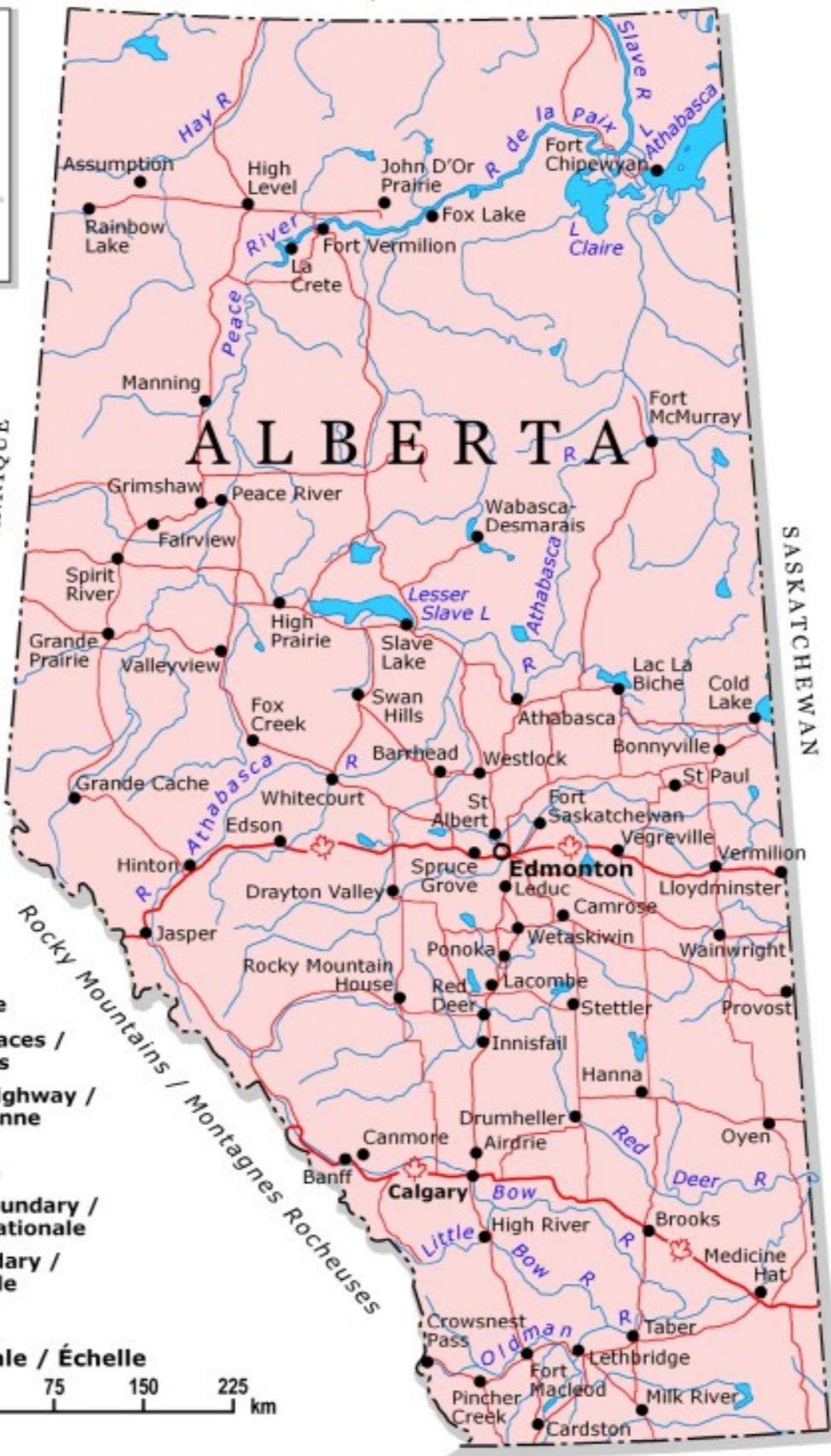
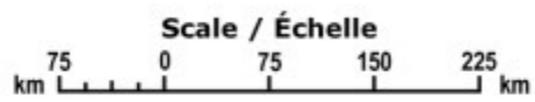


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COLOMBIE-BRITANNIQUE

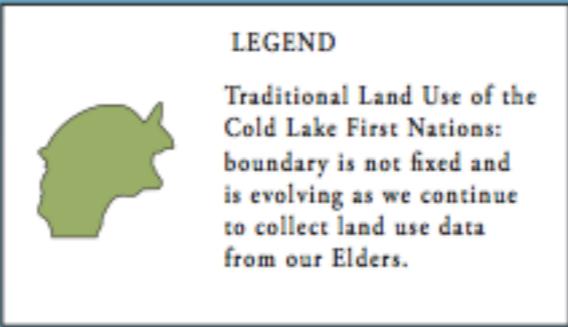
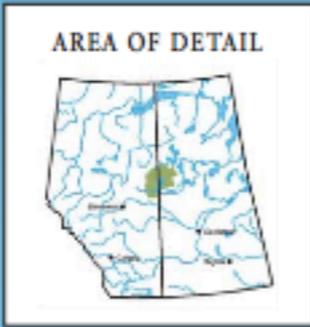
SASKATCHEWAN

Rocky Mountains / Montagnes Rocheuses

- LEGEND / LÉGENDE**
- Provincial capital / Capitale provinciale
 - Other populated places / Autres lieux habités
 - Trans-Canada Highway / La Transcanadienne
 - Major road / Route principale
 - International boundary / Frontière internationale
 - Provincial boundary / Limite provinciale



Traditional Land Use of the Cold Lake First Nations



Prepared by COLD LAKE FIRST NATIONS Primrose Landclaim Office ©2003

Landmark Orientation in Dene

- The main limitations were the water systems (rivers and lakes) delimiting the territory, i.e., cognitive maps of water streams and lakes as map coordinates (Note: former hunting area stretched to the Hudson Bay in the East; ca. 1700 km of distance, 1775km to the North (Yelloknife), 1700km West).

Water Systems as Landmarks I

- *Këchaghë-hotinnë* 'down-stream they-dwell' placed west and southwest of Great Slave lake (A), near the mouth of (C) Hay river (702 km) along (B) Mackenzie river (*Deb-Cho*; lengths about 1738 km), and the lower course of (D) Liard river (Curtis 1976: 5; the river spans from the Yukon to British Columbia and the Northwest territories and is about 1115 km long)



Water Systems as Landmarks II

- *Kai-theli-kë-hotinnë* = 'willow flat-country up they-dwell'.
- This region is centering about the western end of Athabaska lake at Fort Chipewyan and extending northward to Fort Smith on Slave river (434 km length) and southward to Fort McMurray on Athapaskan river (1231 km length; Curtis 1976: 3).

Water Systems as Landmarks III

- *Kës-yë-hotínnë* 'aspen house they dwell' encodes a place near the head of the Churchill river system (400 length; Lac Isle à la Crosse, Portage la Loche, Cold lake (373 km²), Heart lake, Onion lake)
- *Háthél-hotínnë* 'lowland they-dwell' which is the region of Reindeer lake draining southward into Churchill river
- *Sa-yísi-dënë* 'sun under (the eastern) people' which is in the barrens between Reindeer lake (5658 km²), Hudson bay, and Chesterfield inlet (Nunavut; West coast Hudson Bay)
- *Tandzán-hotínnë* is on the northern shore of Great Slave lake along Yellowknife river

Water Systems as Landmarks: Some Neighboring Languages

Environmental Spatial Concepts in Koyokon, Hupa, and Navajo

KOYUKON	ALL	AREAL	HUPA	LOC*	SUF	NAVAJO	LOC	SUF
up above	<i>-dege</i>	<i>-degu</i>				up	<i>-dah</i>	<i>-de</i>
down below	<i>-yege</i>	<i>-yegu</i>				down	<i>-yah</i>	<i>-ya</i>
upstream, back behind, to the rear	<i>-na'e</i>	<i>-nuye</i>	upstream (SE)	<i>-nage</i>	<i>-nah-</i>	behind	<i>-ne</i>	<i>-ne</i>
downstream	<i>-do'</i>	<i>-duye</i>	downstream (NW)	<i>-de?</i>	<i>-da-</i>			
up from shore, up on or above shore (from water), toward back (of house)	<i>-nege-</i>	<i>-negu</i>	away from the stream (NE)	<i>-dage</i>	<i>-dah</i>			
down to shore, toward front (of house)	<i>-ene</i>	<i>-uye</i>	towards the stream, downhill (SW)	<i>-ce?ne</i>	<i>-sen-</i>			
ahead, out on open water	<i>-nela</i>	<i>-nelye</i>						
across, on the other side (of the water)	<i>-nane</i>		across the stream (SW)	<i>-mane</i>	<i>-?an-</i>	across	<i>-na</i>	<i>-na</i>
off to the side, away	<i>-?ene</i>	<i>-?uye</i>				beyond, on the other side	<i>-?a</i>	<i>-?a</i>

* LOC = locative; SUF = suffix

Environmental Spatial Concepts in Tlingit and Carrier

TLINGIT		CARRIER	ALL*	LOC	ABL
up above	<i>ké-</i>	up above, over	<i>-do</i>	<i>-doh</i>	<i>-des</i>
down below	<i>ye-, ya-</i>	down, underneath	<i>-yo</i>	<i>-yoh</i>	<i>-yes</i>
upstream (NO)	<i>nakí</i> (N)	upstream, away up (from the outlet of a lake)	<i>-nu?</i>	<i>-nud</i>	<i>-nuz</i>
downstream (S)	<i>?ix-kí</i>	downstream	<i>-da?</i>	<i>-dad</i>	<i>-daz</i>
up from shore, interior	<i>dag</i>	north	<i>-no</i>	<i>-noh</i>	<i>-nes</i>
down toward shore	<i>yeg, ?ig</i>	down towards a body of water	<i>-cen</i>	<i>-cid</i>	<i>-ciz</i>
out to sea, out into open	<i>de-kí</i>	forward	<i>-nes</i>	<i>-nes</i>	
across, on the other side (of water)	<i>yan</i>	behind, in the rear, away from a body of water	<i>-ni?</i>	<i>-nid</i>	<i>-niz</i>
inside	<i>nel</i>	on the opposite side (of the water)	<i>-yan</i>	<i>-yad</i>	<i>-yaz</i>
outside	<i>gán</i> (N)	away, off	<i>-?en</i>	<i>-?ad</i>	<i>-?az</i>
back	<i>qux</i>				

* ALL = allative; LOC = locative; ABL = ablative case

Conclusions

Conclusion I

- Spatial systems in large-scale orientation function according to gestalt principles.
- Parameters such as distance, scope, scale, frames of reference, and other spatial and non-spatial information cues are amalgamed to form cognitive maps for the respective journey.

Conclusion II

- Landmarks shape and determine a detailed topographical cognitive map of the environment as externally represented via language and practices.
- Toponyms serve as coordinate systems based on cognitive maps in dead reckoning orientation.

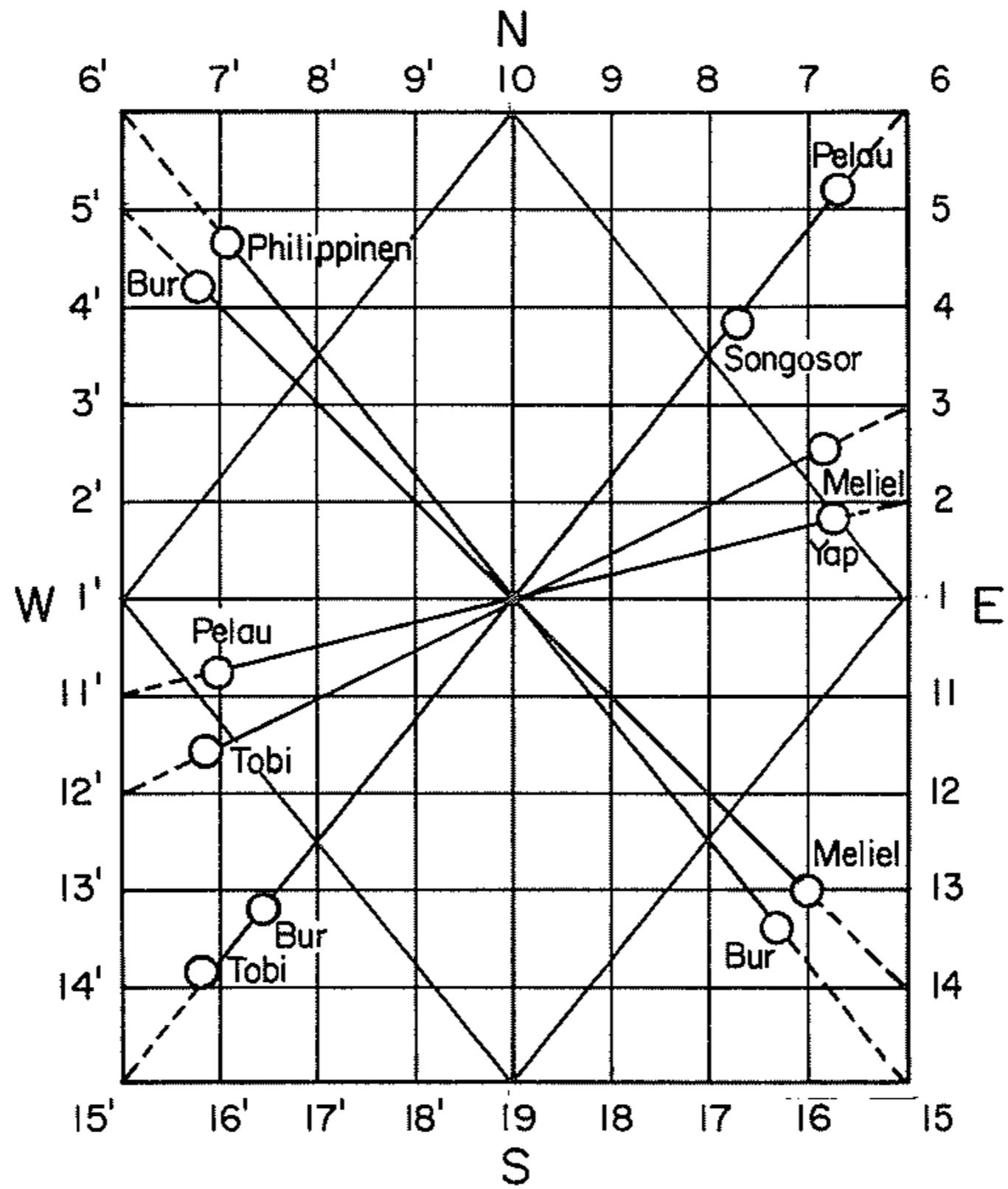


FIG. 95. T. ...

Conclusion III

- Navigation and orientation processes are based on cognitive maps/mental models ordered through both selective and constructive perception (Hutchins 1996: 49).
- This mental computing is based on mental triangulation.



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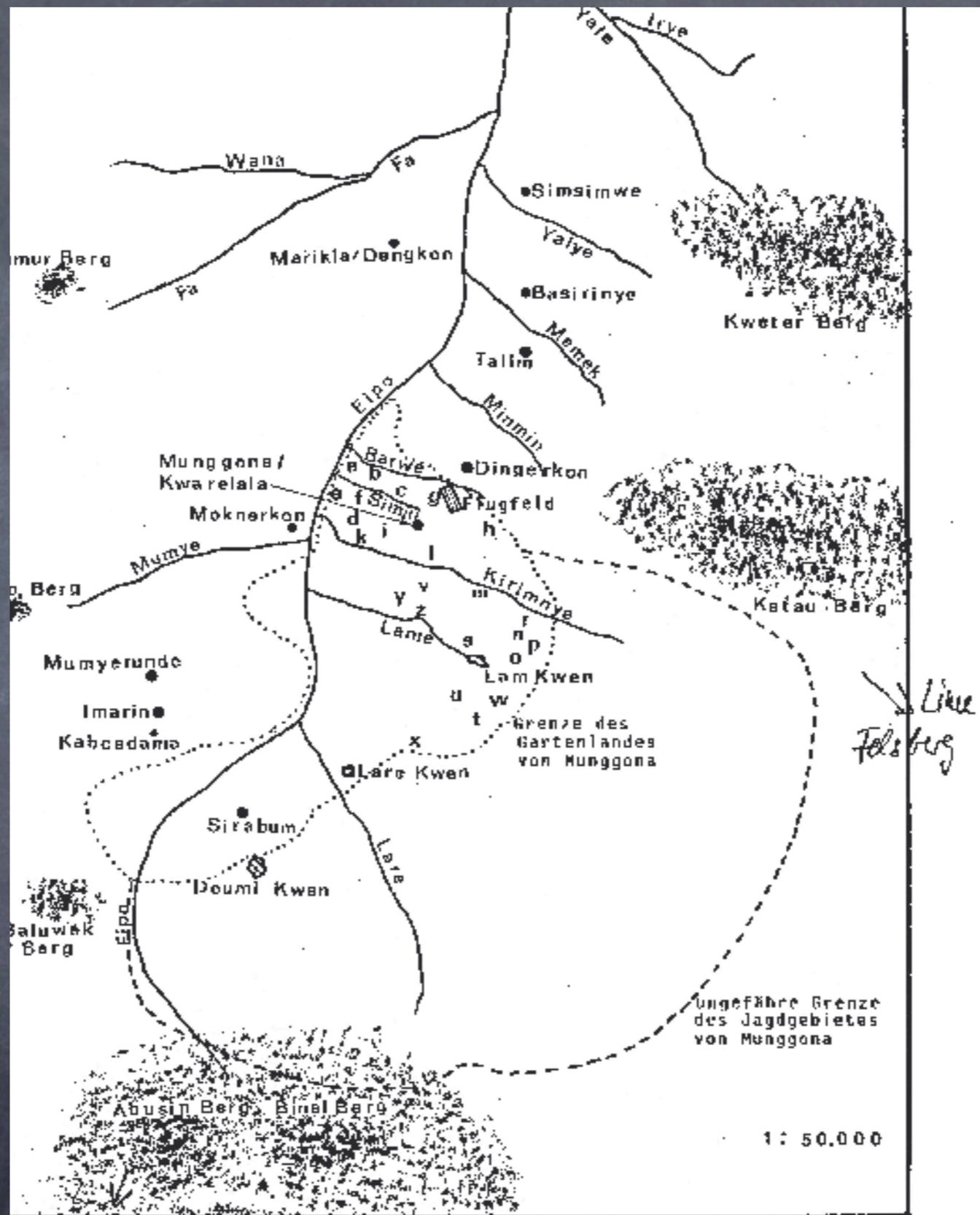
Spatial Thinking and External Representation

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EINIGE FLURNAMEN UM MUNGGONA
 ein Beispiel für die Repräsentation des Raumes