

Measuring Space and Fuzzy Boundaries: Examples from Chinese History

An aerial photograph of a terraced rice paddy field. The terraces are arranged in a series of steps that follow the contours of a hillside. The water in the terraces is a light, silty color. A person is walking on a narrow path that runs along the edge of one of the terraces. The background shows a dense forest of green trees.

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SSHA – St. Louis, Oct 2002

parcel–level space

- corvee and grain tax assessment
- limited public works, irrigation, drainage
- assignment of tenant rights, enfeofment

town–level space

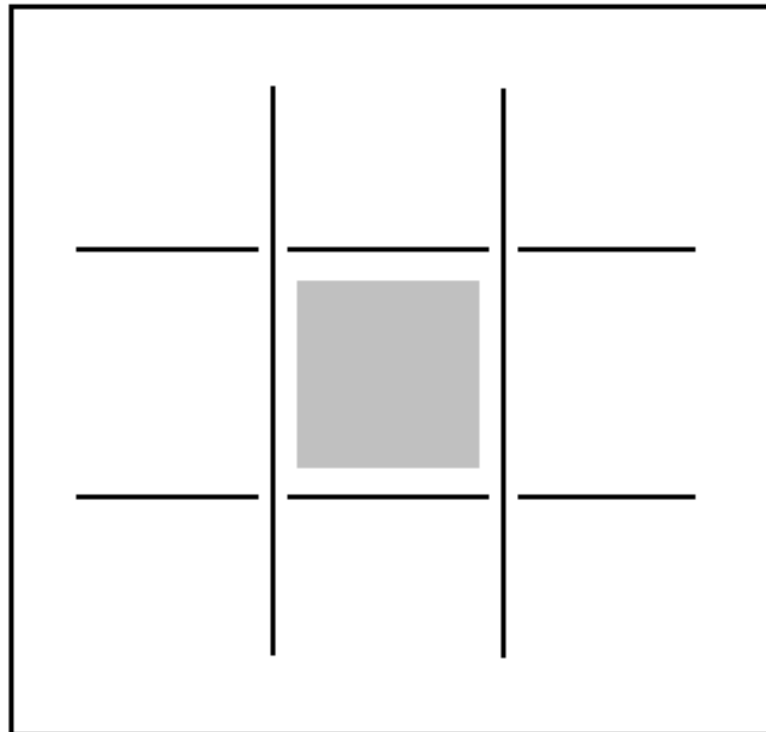
- strongholds, both military and commercial
- intensive public works, fortifications, drainage
- town security and planning
- adjacent areas--residential, agricultural
- hinterland

political–level space

- political spheres of influence
- communication and financial network
- information gathering
- local law enforcement

perception of officially measured space

Jing Tian 井田
Land System



"well-field" land distribution and taxation

Early Qin Period
Land Reform
(circa 4th Cent. B.C.)

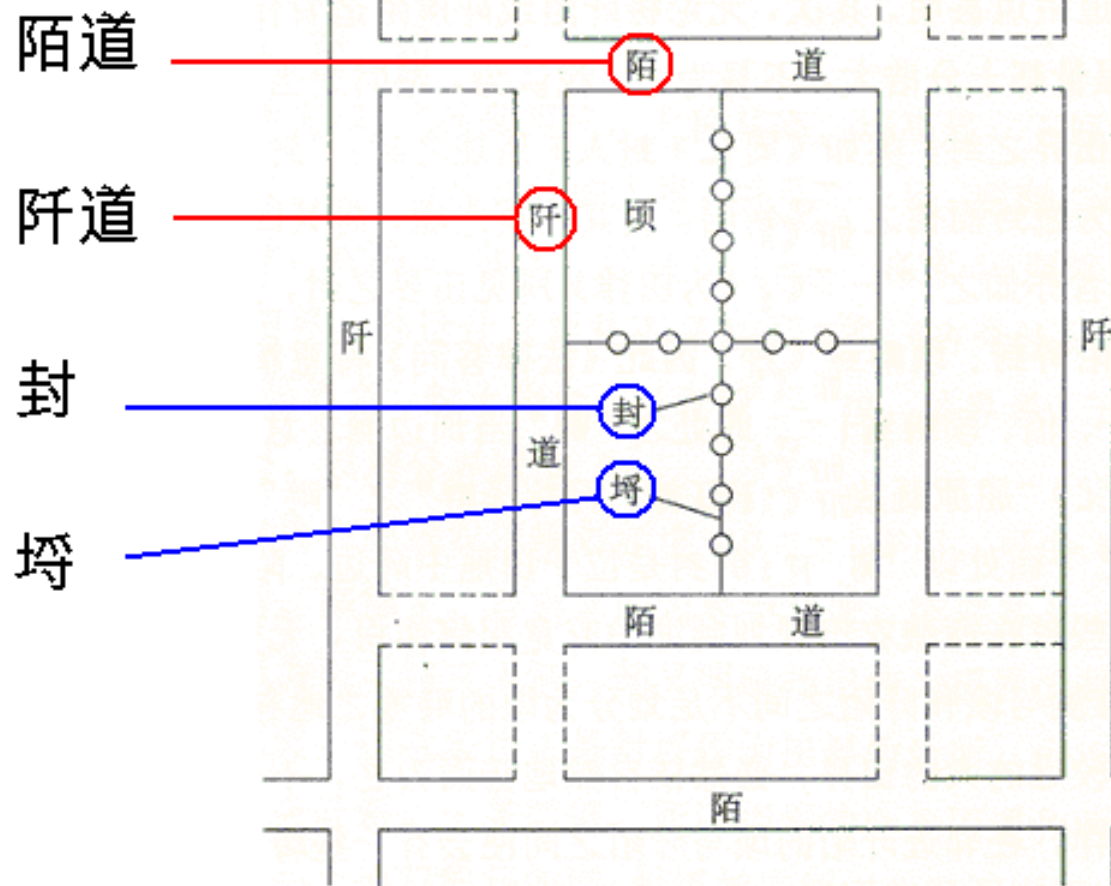
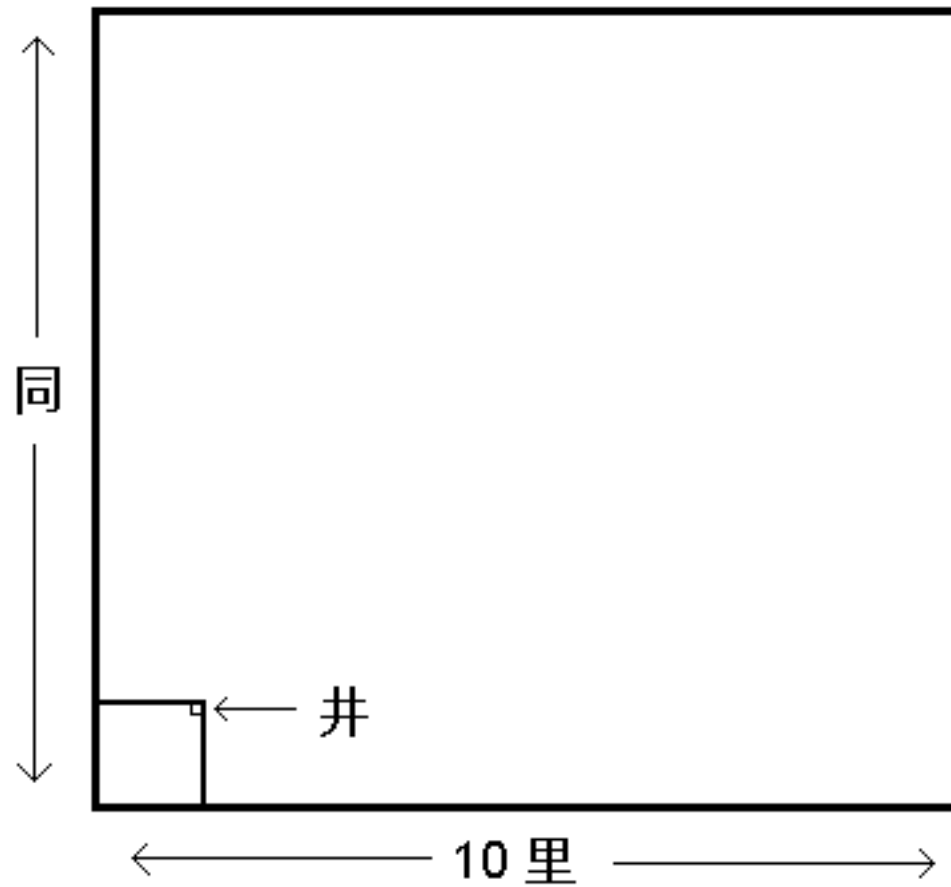


Diagram from Yuan Lin [袁林], 两周土地制度新论 (2000) p.226

Shang Yang – state-distributed land 商鞅 – 国家授田制度



Eastern Han area measure

同 tong = 100 sq. li

里 li = about 0.5 km

1 sq. li = about 0.25 sq. km

100 sq. li = about 25 sq. km

井 jing = basic parcel unit

100 sq. li = 10,000 jing

1 jing = about 2,500 sq. meters

2,500 sq. m = about 0.6 acres

何炳棣, "中国历代土地数字考实" 联经, 1995: p2-3.

Eastern Han area measure, calculations



Eastern China Rice Field

Photo: Lyn Bishop (Zama)

Southwest China Rice Terrace

Photo: Lou Dematteis (IFAD)

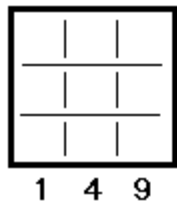


actual fields

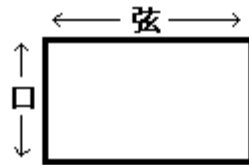


"fish scale map" for tax purposes 鱼鳞图

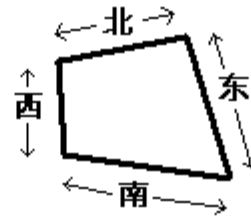
(1) 正方形田



(2) 长方形田



(3) 任意四边形田



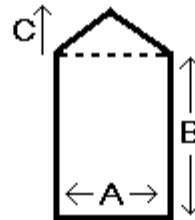
(4) 圆形田



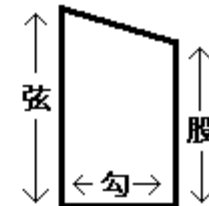
(5) 覆月田



(6) 圭田



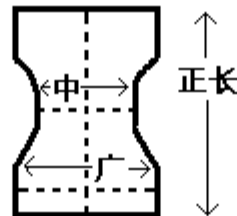
(7) 勾股田



(8) 三广田



(9) 腰鼓田



(10) 大鼓田

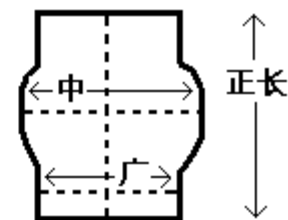


diagram: Lex Berman

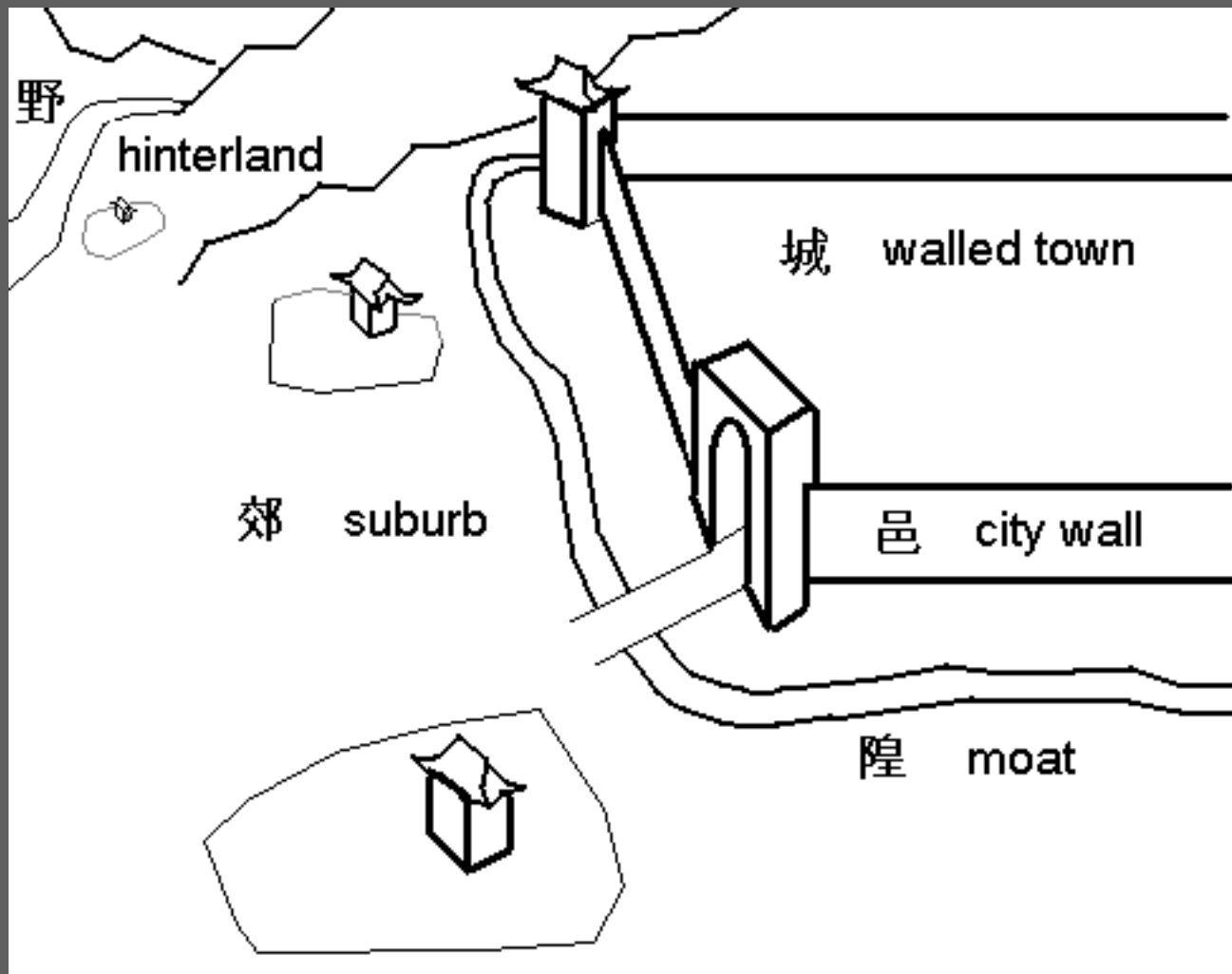
based on an illustration by Wang Deyi 王德毅 (1974)

Li Chunnian's surveying methods (12th Century CE)

do plans fit reality?

- plans don't account for terrain
- we don't know how parcels were actually measured in practice
- households and productive household members were more important in calculating tax than parcel size
- varying soil quality and productivity by area was not accounted for

parcel level space - plans vs. reality



town-level space



map of Anyang administrative seat 安陽

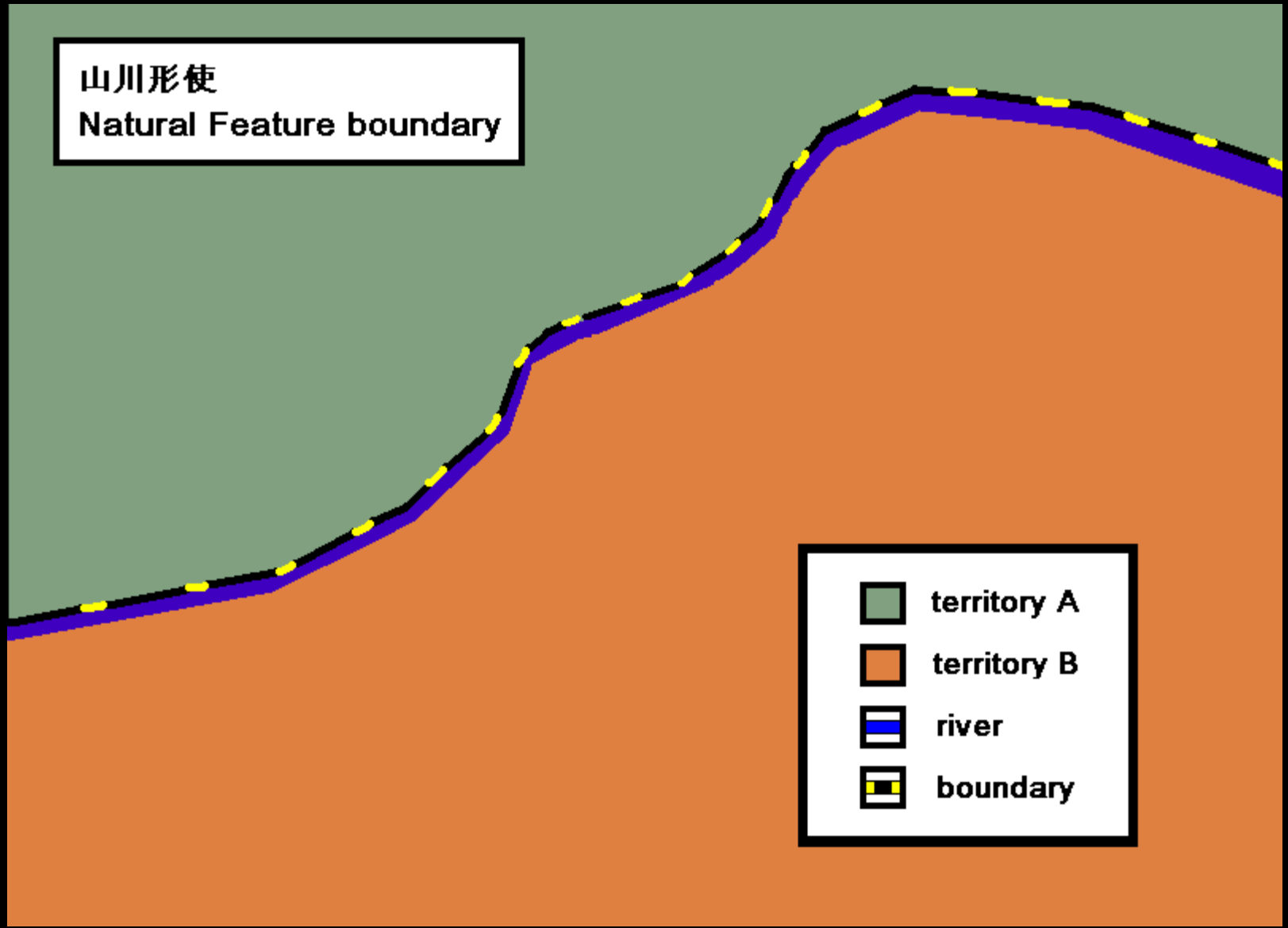
do plans fit reality?

- city plans often highly accurate, though stylized
- archaeological evidence can provide evidence for spatial extents
- information from city plans can be used to identify archaeological finds
- GIS technology is MOST appropriate for studying urban history

town level space - plans vs. reality

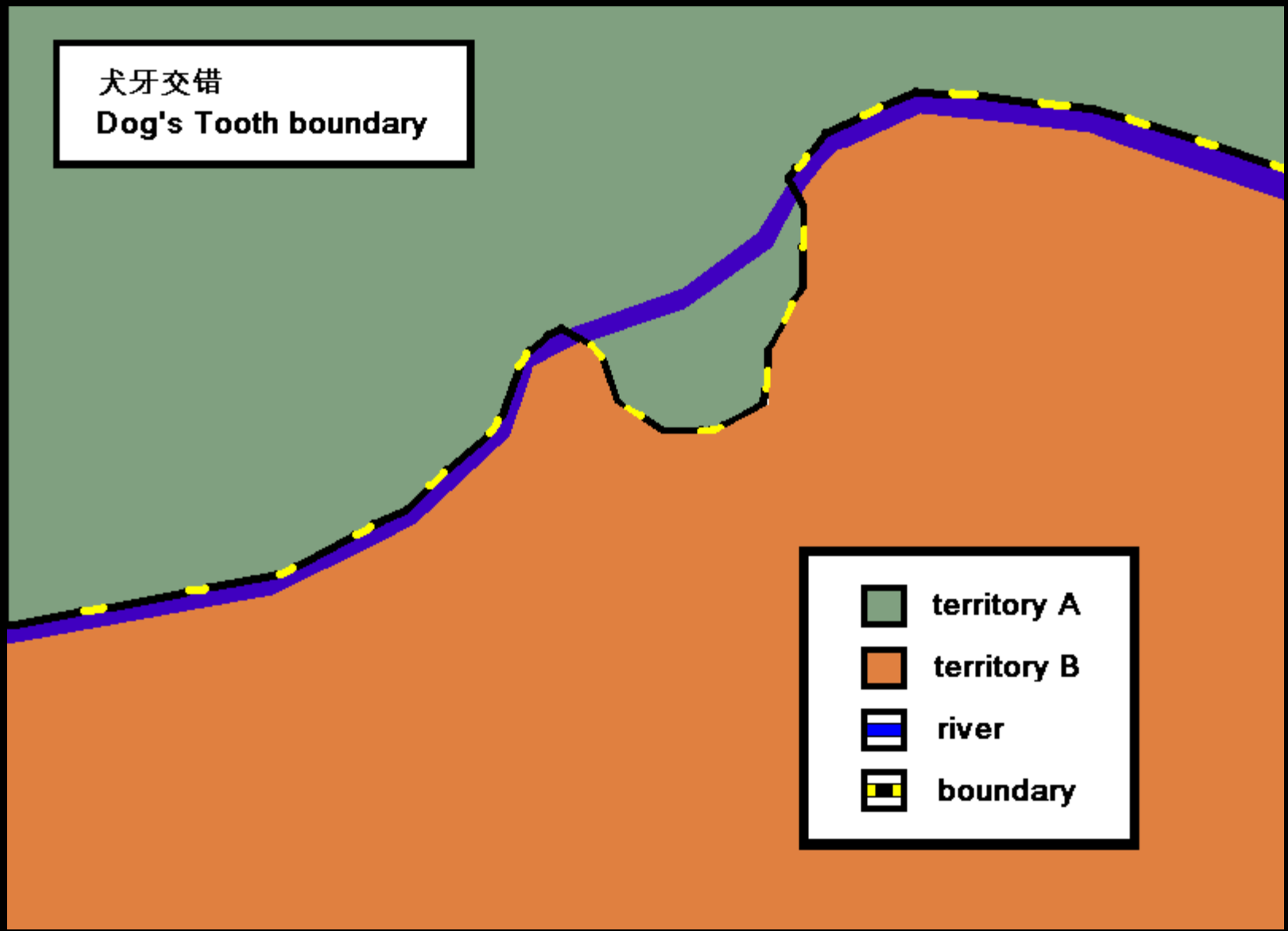
山川形使

Natural Feature boundary



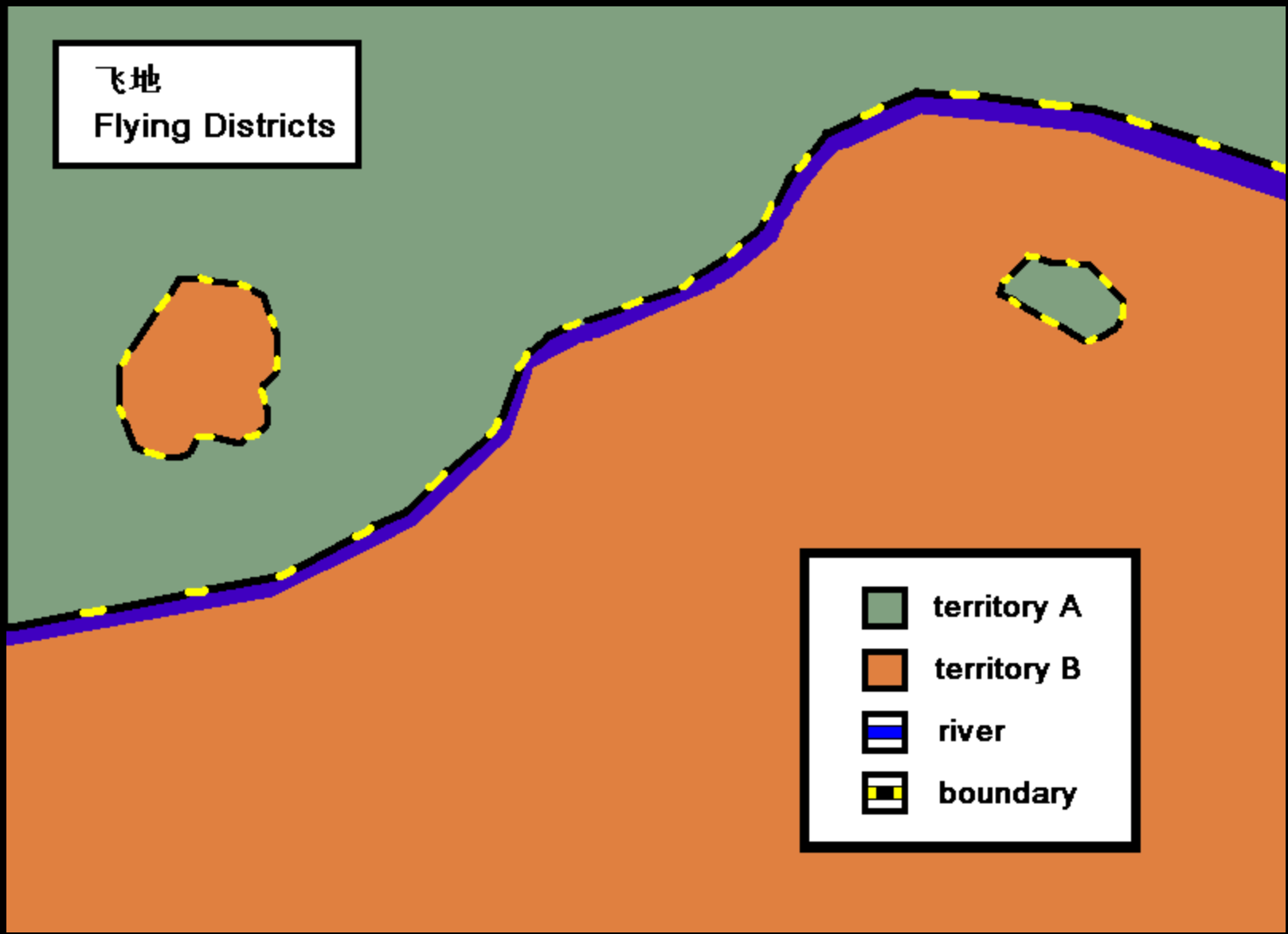
some boundaries follow natural features

犬牙交错
Dog's Tooth boundary



some boundaries do not follow natural features

飞地
Flying Districts



- territory A
- territory B
- river
- boundary

enclaves and exclaves

“qiao zhi” 侨置 expatriate established

usually forced out of their original towns by war or natural disaster, the displaced persons establish new settlements with the same placenames as their abandoned towns. These often existed as quasi-independent enclaves within another jurisdiction, and yet with no status as a part of that jurisdiction. Sometimes, the population was eventually repatriated to their original settlements, other times they were eventually absorbed into the local jurisdiction.

The U.S. has a comparable phenomenon: placenames that settlers brought with them from Europe. So we find Chelsea, Cambridge, Berlin, Montpelier, Ulster, Bristol, Hanover, and the similar examples at every turn in the road.

东晋郡县设置大体沿袭西晋。永嘉之乱后，北方流民大批涌入，各依旧名侨置郡县。东晋在今境先后侨置的州郡有：雍州及京兆郡，扶风郡，始平郡；司州及河南郡，北河南郡，广平郡；秦州、扬州义成郡等。

襄樊政府网站, <http://www.xf.gov.cn/xfgk/djz/qdyq.htm>

“expatriate” enclaves

each “li” 里 was made up of 110 household units

10 were leader’s households

100 were regular households

the 100 regular households were divided in 10 “jia” 甲

so that each “jia” represented 10 households

明清乡里分置情况，据同治《随州志》卷9《里甲》，如下表所示：

乡 名	里 名	甲 数	备 注
上名乡	平港里	10甲	明时有安居、周家， 无会盘、仁心里
	古马里	10甲	
	黄连里	10甲	
	金钱里	10甲	
	大义里	10甲	

随州信息港, <http://www.chinasz.net/lishi/a027.htm>

“li – jia” household registration 里甲

do plans fit reality?

- administrative areas were highly uncertain until the Ming (15th Century), at which point basic county boundaries could be depicted with some degree of supporting evidence
- since the vast majority of historical areas *cannot* be depicted with accurate boundaries, we must account for uncertainty in GIS (which does is quite problematic)
- assuming that official administrative boundaries can be defined, we have not even begun to deal with the issue of nominal claims vs. actual control, indigenous peoples, and conflicting claims to territory

political level space - plans vs. reality



CHGIS: China Historical GIS Project

website: www.fas.harvard.edu/~chgis