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Spatial History - "Using GIS and Open Web Resources to Reconstruct Great Tang Records of the Western Regions on the Silk Route"

Zhaohui Fu

Florida International University, Fujen@fiu.edu

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Spatial History – "Using GIS and Open Web Resources to Reconstruct Great Tang Records of the Western Regions on the Silk Route"

Zhaohui Jennifer Fu
GIS-RS Center
Digital Collection Center
Libraries
Florida International University
February, 2018
Outline

- Spatial History and Digital Humanities
- Silk Route and author XuanZang
- Great Tang Records of Western Regions in web or digital forms
- Mapping of the Records based upon open sources
Spatial History and Digital Humanities
Silk Route and author XuanZang
Great Tang Records of Western Regions in web or digital forms
Mapping of the Records based upon open sources
Digital Humanities

- Technology Infrastructure
  - Text-mining, big data, data visualization
  - Web publishing/authoring on open platforms
  - Crowd-sourcing and collective knowledge

- Spatially-Enabled
  - Visual story-telling (Story Maps)
  - Mapping through space and time (Spatial History)
On Sunday the 2nd of September 1666, the Great Fire of London began reducing most of the capital to ashes. Among the devastation and the losses were many maps of the city itself.

**The Morgan Map of 1682** was the first to show the whole of the City of London after the fire. Produced by William Morgan and his dedicated team of Surveyors and Cartographers it took 6 years to produce, and displayed a brighter perspective on city life for a population still mourning their loved ones, possessions, and homes.

But how much of this symbolised vision of a hoped-for ideal city remains today? What now lies on the lush green fields to the south of the river Thames? And how have the river’s banks been eaten into by the insatiable appetite of urban development? **Move the spyglass to find out, and**
Mapping through Space and Time

Spatial History Project

Mapping U.S. Post Offices in the Nineteenth-Century West

Geography of the Post
U.S. Post Offices in the Nineteenth-Century West

1847 – 1902

Filter offices by:
- Established
- Discontinued

Stanford University
Established: 1893
Closed: 1927

(launch interactive map)
Spatial History and Digital Humanities
Silk Route and author XuanZang
Great Tang Records of Western Regions in web or digital forms
Mapping of the Records based upon open sources
Caravane on the Silk Route

Source: Cave Number Mogao 323, the North Wall of Main Chamber
Buddhist Pilgrimage to India – XuanZang

9th century mural painting of the Buddhist monk Xuanzang travelling with a tiger.

Mogao Caves, Dunhuang, Gansu Province.

Source: Professor Li Xiguang
- Spatial History and Digital Humanities
- Silk Route and author XuanZang
- Great Tang Records of Western Regions in web or digital forms
- Mapping of the Records based upon open sources
Great Tang Records of Western Regions
Spatial History and Digital Humanities
Silk Route and author XuanZang
Great Tang Records of Western Regions in web or digital forms
Mapping of the Records based upon open sources
Mapping of Records of Western Regions

- Goals
  - 1) validate the unknown or unidentified ancient places recorded by XuanZang;
  - 2) A digital story map of Records of Western Regions

- Completed work
  - Digitizing routes
  - Identify coordinates of places
  - Geo-database and visualization on ArcGIS online

- Resources
  - Wiki and Baidu entries of places and cities with reference to XuanZang;
  - Getty’s Geographic Names thesaurus
XuanZang Routes Published on Google Maps

https://www.google.com/maps/d/viewer?mid=1aA0N5NqAgba2cKeY0_Z4Kk3pSsM&hl=en_US&ll=29.007840244148934%2C87.91869149999991&z=4
Scanned Maps of XuanZang Routes
Digitizing and rectifying Xuanzang routes (base maps)

ESRI base maps data sources: ESRI, Delorme, NAVTEQ, TomTom, Intermap, increment P Corp, GEBCO, USGS, FAQ, NPS, NRCAN, GeoBase, Kadaster NL, Ordnance Survey, ESRI Japan, METI, and the GIS User Community.

ESRI Topographic maps: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, INCREMENT P Corp.

ESRI World Imagery: Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.
Digitizing and Rectifying Xuanzang routes
<table>
<thead>
<tr>
<th>Attributes</th>
<th>Attributes</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place Name</td>
<td># of temples</td>
<td>Sangharama; Buddhist Temples</td>
</tr>
<tr>
<td>Place Name</td>
<td># of believers</td>
<td>Buddhists dwellers in the temples</td>
</tr>
<tr>
<td></td>
<td>Religious notes</td>
<td>Branches of Buddhism; and other religious practices</td>
</tr>
<tr>
<td>Present location</td>
<td>Significant sites</td>
<td>Temples; Stupa; holy sites</td>
</tr>
<tr>
<td>X East</td>
<td>Mythology</td>
<td>Stories about the kings; dragons; Buddha, and bodhisattvas; etc</td>
</tr>
<tr>
<td>Y North</td>
<td>Vegetation and Climate</td>
<td>Plants, agricultural products; weather conditions</td>
</tr>
<tr>
<td>Physical</td>
<td>Products; Currency; Custom</td>
<td>Low frequency of recording</td>
</tr>
<tr>
<td>People</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Creation of an On-Line Map of Western Regions

Legend
- buddhist pilgrimage routes points
  - Source: Jennifer Fu - With Chinese
- Silk Roads Sites - Kyrgyzstan
- Silk Roads Sites - Uzbekistan
- Xuan Zang Landmark Points - Source: Google User
- Route Xuan Zang
Creation of an On-Line Map of Western Regions
Remaining challenges

- Multi-lingual, including classical and contemporary Chinese;
- Unknown places – Geographic names changed through time; versions of interpretations; Places not travelled by heard by Xuanzang;
Possible Solutions

- Text-mining and harvesting from existing resources to expand knowledge about the places;
- Publish it in open platforms to invite crowd contributions in transcribing, and translating.
- Linked Data -- Getty’s Thesaurus of Geographic Names; to verify historical and contemporary names of the places, particularly unknown places
- Using GIS methods and Xuanzang’s description of directions, distances of the places, and surrounding geographic features (river, mountains, etc) to model the potential areas;
<table>
<thead>
<tr>
<th>Name</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>WiKi</td>
<td>Multilingual; Maps, Coordinates;</td>
</tr>
<tr>
<td>The Getty Thesaurus of Geographic Names</td>
<td>TGN may be linked to GIS, maps, and other geographic resources; Link Data</td>
</tr>
<tr>
<td>Geonet Names Server</td>
<td>Open Street Map; repository of foreign place-name decisions approved by the U.S. Board on Geographic Names</td>
</tr>
<tr>
<td>Chinese Text Project</td>
<td>Chinese contemporary and classical dictionaries, thesauri with English translation of Chinese terms</td>
</tr>
</tbody>
</table>
Buddhas of Bamiyan

From Wikipedia, the free encyclopedia
(Redirected from Bamiyan Buddha)

The Buddhas of Bamiyan (Persian: بامیانیان) were 4th- and 5th-century monuments of standing buddhas carved into the side of a cliff in the Bamiyan valley in the Hazarajat region of central Afghanistan, 230 kilometres (140 mi) northwest of Kabul at an elevation of 2,500 metres (8,200 ft). Built in 507 CE (smaller) and 594 CE (larger), the statues represented the classic blended style of Gandhara art. They were 35 (115 ft) and 53 meters (174 ft) tall, respectively.[5] The main bodies were hewn directly from the sandstone cliffs, but details were modeled in mud mixed with

It is believed that the monumental Buddha sculptures were carved into the cliffs of Bamiyan between the 3rd to 6th centuries AD, while the cave complex in the east, including the 38 meter Buddha, a stupa was built in the 3rd or 4th centuries AD. The 55 meter Buddha is believed to date from the 5th and 6th centuries AD.

Historic documentation refers to celebrations held every year attracting numerous pilgrims and that offers were made to the monumental statues (http://whc.unesco.org/uploads/nominations/208rev.pdf). They were perhaps the most famous cultural landmarks of the region, and the site was listed by UNESCO as a World Heritage Site along with the surrounding cultural landscape and archaeological remains of the Bamiyan Valley. Their color faded through time.[11]

Chinese Buddhist pilgrim Xuanzang visited the site on 30 April 630 AD,[12][13][14] and described Bamiyan in the Da Tang Xiyu Ji as a flourishing Buddhist center "with more than ten monasteries and more than a thousand monks". He also noted that both Buddha figures were "decorated with gold and fine jewels" (Wriggins, 1995). Intriguingly, Xuanzang mentions a third, even larger, reclining statue of the Buddha.[4][14] A monumental seated Buddha, similar in style to those at Bamiyan, still exists in the Bingling Temple caves in China's Gansu province.
<table>
<thead>
<tr>
<th>字</th>
<th>略</th>
<th>異體字</th>
<th>讀音</th>
<th>今譯</th>
<th>漢語字典 icaspine</th>
<th>彭海潮</th>
<th>廈海潮</th>
</tr>
</thead>
<tbody>
<tr>
<td>窺+17 窃</td>
<td>qiè</td>
<td>ㄑĕ</td>
<td>偷，盜。/ 非分占有；用不正當的手段獲取。/ 抄襲。/ 男女私通。/ 副詞：偷偷地，暗地裡。/ 謂諱：私下，私底。/ 顏色</td>
<td>卷4頁 2747第07頁</td>
<td>卷1第08頁 0023第02頁</td>
<td></td>
<td></td>
</tr>
<tr>
<td>以人+3 目</td>
<td>yì</td>
<td>ㄧˋ</td>
<td>用，使用。/ 認爲。/ 營連。/ 帶。/ 遠及。/ 有。/ 原因。/ 介詞：因為。/ 介詞：從，從。/ 介詞：在……時候。/ 介詞：拿，用。/ 介詞：按照；依照。/ 介詞：依靠。/ 介詞：憑藉……身份。/ 介詞：跟，跟。/ 邊詞：表示儀後行動是前一行动的目的。/ 邊詞：用在狀語與動詞之間，表示修飾。/ 邊詞：表示並列，有「並且」的意思。/ 邊詞：表示輔助，有「但是」的意思。/ 邊詞：表示結果，有「因而」的意思。/ 助詞：和某些方位詞，時間詞等連用，表示時間和方位。/ 句末，句中語氣詞。07 通「已(1)」 yì ㄧ：停止，停止。/ 通「已(7.2)」 yì ㄧ：副詞：已經。/ 通「已(9.1)」 yì ㄧ：副詞：甚，太。</td>
<td>卷1頁 0105第01頁</td>
<td>卷8第94頁 7601第01頁</td>
<td></td>
<td></td>
</tr>
<tr>
<td>穹+3 通</td>
<td>qióng</td>
<td>ㄑㄩㄥˊ</td>
<td>high and vast; elevated; arched</td>
<td>卷4頁 2721第03頁</td>
<td>卷9第862第29頁 9750第4頁</td>
<td></td>
<td></td>
</tr>
<tr>
<td>儀人+13 仪</td>
<td>yí</td>
<td>ㄧˊ</td>
<td>ceremony, rites gifts; admire</td>
<td>卷1頁 0228第02頁</td>
<td>卷1第118第21頁 2760第3頁</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chinese Text Project

竊以穹儀方懋之廣。蔭懷懷靈之異。談天無以究其極。括地鉅足辯其原。是知方志所未傳。聲教所不暨者。豈可勝道哉。
詳夫天竺之為國也。其來尚矣。聖賢以之肇軌。仁義於焉成俗。然事絕於曩代。壤隔於中土。山經莫之紀。王會所不書。
博言，昆明道閉。謬肆力於神池。遂使瑞表恆星。鬱玄妙於千載。夢彰開日。秘神光於萬里。暨於蔡愔訪道。
Sources and Contributors:

Вактрия [VP]

National Register of Historic Places online (2000-)

Bactria [VP Preferred]


Bactriana [VP]


Bākhtar [VP]

National Register of Historic Places online (2000-)

Bakhtrish [VP]

National Register of Historic Places online (2000-)

Daxia [VP]

National Register of Historic Places online (2000-)

Ta-hsia [VP]

National Register of Historic Places online (2000-)

Subject: .... [VP]
Adding to Records of Western Regions

Wiki Entry: Peshawar

Getty’s Linked Data: Peshawar
Kien-t’o-lo--Gandhāra.

The kingdom of Gandhāra is about 1000 li from east to west, and about 800 li from north to south. On the east it borders on the river Sin (Sindb). The capital of the country is called Po-lu-sha-pu-lo; it is about 40 li

53 The phrase *tsze chu*, which is of frequent occurrence in Buddhist composition, seems to mean “moreover” or “besides this.”

54 The country of Gandhāra is that of the lower Kābul valley, lying along the Kābul river between the Khoaspes (Kunar) and the Indus. It is the country of the Gandārae of Ptolemy (*Geog.*, lib. vi. c. i, 7). The capital was Purushapura now Peshāwar. The Gandārii are mentioned by Hekataiōs (*Fr.* 178, 179) and Herodotos (lib. iii. c. 91, lib. vii. c.
Kanishka

From Wikipedia, the free encyclopedia

For other uses, see Kanishka (disambiguation).

Kanishka I (Sanskrit: Kaniśka (कनिष्क); Bactrian: Канишку, Kaneshk; Middle Chinese: 迦腻色伽 (Ka-ni-sak-ka > New Chinese: Jianiseija)), or Kanishka the Great, was the emperor of the Kushan dynasty in the second century (c. AD 127–150). He is famous for his military, political, and spiritual achievements. A descendant of Kushan empire founder Kujula Kadphises, Kanishka came to rule an empire in Bactria extending from Turfan in the Tarim Basin to Pataliputra on the Gangetic plain. The main capital of his empire was located at Purusapura in Gandhara, with another major capital at Kapisa.

His conquests and patronage of Buddhism played an important role in the development of the Silk Road, and the transmission of Mahayana Buddhism from Gandhara across the Karakoram range to China.

Earlier scholars believed that Kanishka ascended the throne in 78 CE, and that this date was used as the beginning of the Saka calendar era. However, this date is now not regarded as the historical date of Kanishka's accession. Kanishka is estimated to have accessed to the throne in AD 127 by Falk (2001).[1]