

Climate change and water use in the Heihe River Basin :

information from historical documents

Part I :Han Period

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Early Imperial Chinese dynasties based on the Yellow River basin of now Shaanxi and Henan province where were relatively wet and warm. On the end of the 2nd century B.C., Han dynasty first advanced into the arid Edsen-gol region. Until then, Edsen-gol region had been under the rule of a Nomadic state, Xiongnu. Xiongnu often struggled with Imperial Chinese dynasties like Qing and Han. In 200 B.C., Xiongnu won a victory over Han, and Han had to adopt an appeasement policy about diplomatic relations with Xiongnu. It was so humiliating to Han court.

After Wudi 武帝 of Han started to govern by himself, he removed the appeasement policy, and the Han army and diplomatic missions were sent over the frontier wall. The war between Han and Xiongnu was reopened. In 121 B.C., Hunye-wang 渾邪王 surrendered to Han. Therefore, Han advanced into the Hexi corridor and established Hexi four commandery 河西四郡, Wuwei 武威, Zhangye 張掖, Jiuquan 酒泉, Dunhuang 敦煌, that were directly controlled by Han government . It was an epoch-making event that an Imperial Chinese dynasty went into ruling arid area.

While Han government established a direct controlled territory, they built large defense facilities on the Hexi corridor. The frontier wall and watch towers are ranging from west of Dunhuang Yumenguan-gate 玉門關 (an oasis near the end of Sulu River 疏勒河) to Juyan 居延 area (an oasis near the end of Ruoshui 弱水). Ruins estimated Han watch towers stretch toward east. Someone thinks that the line of these watch towers may extend to Ordos.

Wooden slips were unearthed from these watch towers and ruins of their upper sections. We call these wooden slips unearthed on Juyan area Juyan wooden slips of Han Dynasty 居延漢簡 (Juyan Hanjian). The Scientific Expedition to the North-West Provinces of China under the leadership of Dr. Sven Hedin (The Sino-Swedish Expedition) investigated Edsen-gol region in the 1930's, and they found over one

million wooden slips. After then, Chinese scholar excavated Juyan area in the 1970's and 2000's. Two million wooden slips are classified and published until now.

We can divide the excavated area of Juyan into two oasis area. One is the area between Ikhen-gol river basin and Juyan Lake. This oasis area is surrounded by frontier walls and watch towers. Other one is the oasis, now Dingxin 鼎新 and Shuangcheng 双城. Commandant-office 都尉府, which is under the direct control of commandery, was established in each oasis.

We can find out an administrative system of Hexi corridor in Han dynasty from Juyan wooden slips (Fig.1). Because wooden slips were unearthed from defense facilities like watch towers, most of records written with wooden slips are about defense system. But there is little information about administrative system, so the exact place of Juyan district is not confirmed until now.

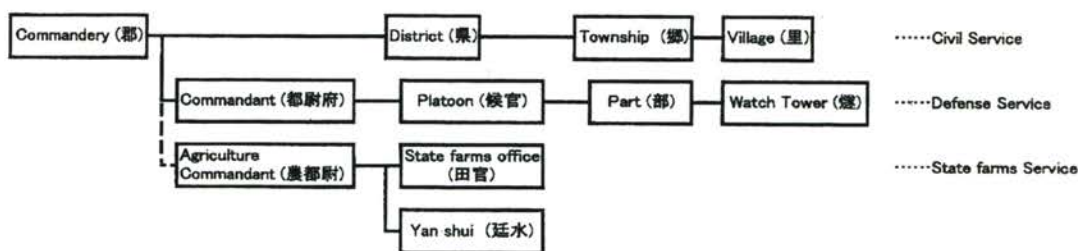


Fig. 1¹

State farms section existed besides defense and administrative section. It had jurisdiction over state farm. On wooden slips, we can find words like “Tianzu 田卒”, “Tianguan 田官”. Tianzu means state farms soldier, Tianguan (state farms office) controlled them. “Hanshu 漢書 (The History of Han Dynasty)” says that large scale farming development policy, called “daitianfa 代田法”, was put into effect. The word “daitiancang 代田倉 (granary for daitianfa)” is found in records of wooden slips unearthed from A10, and we can know that a farming development based on daitianfa was carried out in Juyan area. From A10, a plow also was unearthed (Fig.2), so it is clear that this area was used as cultivated land. But now, it is said that this A10 area is covered with sand drifts very

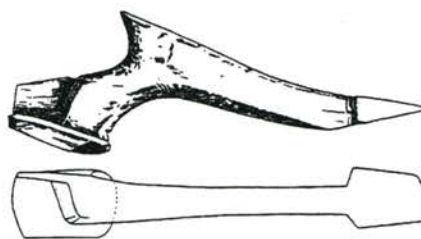


Fig.2

¹ As Qiu Xigui 裘錫圭 (“Management of government-owned farmlands in Qin-Han period seen from excavated written documents 從出土文字資料看秦和兩漢時代官有農田的經營” *Integrated studies of Chinese archaeology and historiography* 中國考古學與歷史學之整合研究, 1997.7, Taipei) mentions, Agriculture Comandant might belong to Chamberlain for the national treasury 大司農.

thickly, so it is difficult to find out a trace of cultivating of Han period.

However, we can see farming ruins with pottery of Han and Xixia (or Yuan) period in the same place. Especially, southeast of L□cheng 綠城 is set up by remains of channels, so we can consider this area was large-scale cultivated land. In this “L□cheng Area”, there are a lot of tombs of Wei-Jin period; moreover tomb of Bronze Age was also excavated, so it is obvious that human beings settled down in this area for long time. The theory of Li Bingcheng 李并成 who suggests Juyan district was placed at L□cheng is not supported by many scholars², but when the target of consideration is expanded to “L□cheng Area”, it is necessary to reexamine his theory. But there is not enough data for us to discuss about this problem, because neither Stein nor Bergmann reached to “L□cheng Area”. To solve this outstanding problem, it is very important to clear the age when each irrigation ditch and cultivated land started to use.

It is notable that records on Tianguan are only found in Wudi, Zhaodi 昭帝, and Xuandi 宣帝 periods. In an early period of Juyan development, state farms soldier cultivated farmlands, and soon, common people took a place of state farms soldier. Therefore, administrative section also took a place of state farms office. It was continued at least to Wei-Jin period when power of central government decreased by war.

Besides Tianzu, a word “Zhiquzu 治渠卒 (millrace maintenance soldier)” is found in wooden slips. They maintained irrigation ditches under “Yanshui 延水”. They estimate that state farm area were on around K710 and A8 (Jiaqu Houguan 甲渠候官). The name Jiaqu Houguan came from an irrigation ditch that was conducted water from Ikhen-gol. Tianguan controlled subordinates named “Diyizhang 第一長 (First manager)”, “Dierzhang 第二長 (Second manager)”.

“The forth manager, Anqin 安親 pressed a total of 27143 labors into farming during 224days, from January to August. Suppose 121 labors cultivate per day. 39 labors should be left over. They cultivated a total of 41qing 44mu 124pu. Suppose a labor cultivates 34mu. 30mu 124pu land should be left over. The crop is 2913shi 1dou 1sheng. Suppose a labor harvest 24shi. 9shi should be left over.”

(72.EJC-1)³

The numbers of managers meant the numbers of irrigation ditches. This fact is evidence that farmlands were organized with each irrigation ditch.

Not only state farms soldiers but also common people cultivated farmlands. Most

² Li Bingcheng, “New consideration on Juyan district of Han dynasty 漢居延渠城新考” *Kaogu* 考古 1998-5 pp.82-85.

³ The picture of this wooden slip is not published so far. Only letters are published on *Precise interpretations of new Juyan wooden slips of Han Dynasty* 居延新簡釋粹, 1988.1, Lanzhou, p.87.

of them were forcibly immigrated from Yellow river basin. “Hanshu” mentions “extremely poor peoples of Guandong 關東, persons who retaliated in inadequate way, atrocious persons” as forcibly immigrated peoples. “Extremely poor peoples of Guandong” is thought that “residents of Yellow river basin who suffered damage from the flood caused by destructive development in Ordos”.

The chief of Juyan district was called “Juyan magistrate (Juyan ling 令)”. In the Han era, if a district controlled over million households, a chief of the district was called “ling”. So we can say many immigrants from Yellow river basin lived in Juyan district. After middle period of East Han, wooden slips of Juyan decreased sharply. But it only means frontier walls and watch tower lost there function as defense facilities. Descendants of immigrants from Yellow river basin kept on farming in Juyan area.