History and Tradition: The Origins of the Quebei Reservoir

William Gordon Crowell

Abstract

The origins of the strategically and economically important Quebei reservoir have long been attributed to the sixth-century B.C. Chu statesman Sunshu Ao, making it China’s earliest major irrigation complex. Despite sparse evidence, this tradition became widely accepted, especially in the Huainan region. Challenges to the attribution did not rest on stronger bases and likewise assumed the reservoir to be of pre-Han origin. In reality, careful examination of the sources, of the development of hydraulic technology, and of the political context points to a Western Han origin for the Quebei irrigation complex. The result is a better appreciation of the transitional nature of the Western Han for Chinese agriculture and a cautionary example of the pitfalls of studying local history.

1 This is part of a broader study of Shouchun and Quebei that began with a trip to Shouxian in 1980 while I was a visiting scholar at Nanjing University supported by a grant from the Committee for Scholarly Communication with the People’s Republic of China. I wish to thank Zhang Rongchun 章榮春 and the Nanjing University Foreign Affairs Office for making arrangements, Sun Shuqi 孫述圻 of the History Department, who accompanied me, and the leadership and staffs of the Shouxian Revolutionary Committee, the Shouxian Museum project and the Shouxian Bureau of Water Conservancy. Special thanks are due to the late Mr. Sun Jianming 孫劍鳴 of Shouxian, to Dr. Hsing I-tien of the Academia Sinica, and to Professor Rafe de Crespigny for their comments and suggestions. Other invaluable contributors are Shouxian Museum Deputy Director Xu Jianqiang 許建強, Dr. Robert Felsing of the University of Oregon Library, Mr. Tom Szymoniak, consulting civil engineer, and Jeffrey A. Howard. The present article has benefited from comments by an anonymous reader of an earlier version and the insightful suggestions of the editor. An important part of the research was done during two months as a visiting scholar at the Institute of History and Philology, Academia Sinica, in 2006. Errors and deficiencies, nonetheless, remain all mine.
Résumé
L’origine du réservoir Quebei, dont l’importance économique et stratégique était grande, a longtemps été attribuée à Sunshu Ao, un homme d’État du Chu au Ve siècle avant notre ère, ce qui en aurait fait le plus ancien système d’irrigation à grande échelle en Chine. Malgré la pauvreté des données venant l’appuyer, cette tradition a été largement acceptée, notamment dans la région du Huainan. Lorsqu’elle était contestée, c’était sur des bases tout aussi faibles, et en tout état de cause nul ne mettait en doute que le réservoir datait d’avant les Han. L’examen attentif des sources et la prise en compte de l’histoire des techniques hydrauliques et du contexte politique suggèrent qu’en réalité le système d’irrigation du Quebei a été créé sous les Han Occidentaux. Il en ressort une meilleure appréciation du caractère transitionnel des Han Occidentaux dans l’histoire de l’agriculture chinoise et une conscience accrue des pièges de l’histoire locale.

Keywords
Quebei, irrigation, Sunshu Ao, Huainan, agriculture, Shouchun

When on January 13, 1988 the State Council of the People’s Republic of China announced approval of 258 sites proposed for designation as National Important Cultural Property Preservation Units, the first site under “Ancient Structures and Historical Commemorative Structures” read “Anfengtang (Quebei): Spring and Autumn period; Shouxian, Anhui.”2 Anfengtang 安豐塘 is an irrigation reservoir about 40 km south of the city of Shouxian, which is located where the Eastern Fei River joins the Huai River.

Such designation for a functioning irrigation reservoir such as Anfengtang must surely be considered unusual. Unlike the renowned irrigation

2) Anfengtang zhi 安豐塘志, comp. Anhui sheng shuili zhi bianzuan wei yuanhui 安徽省水利志編纂委員會 (Hefei: Huangshan shushe, 1995), 111. Throughout its history Shouxian has been variously known as Shouchun 寿春, Shouyang 寿陽, and Shouzhou 寿州. The changes are due to either taboo avoidance on an imperial name or administrative change. The particular name adopted here will be according to the period being discussed. The pronunciation que for 芍 is unique to this reservoir and is based on glosses by Yan Shigu and Li Xian; see respectively Hanshu 漢書 (Beijing: Zhonghua shuju, 1962) [hereafter HS], 28A.1569, 28B.1639, and Hou Hanshu 後漢書 (Beijing: Zhonghua shuju, 1965) [hereafter HHS], 76.2466. As will become apparent, the term bei陂 has a number of possible meanings, and its significance in a given instance is determined by context. Among others, it can refer to a natural pond, a dike, or a reservoir. The matter is complicated by the fact that the nature of a given bei might change through time. In this discussion, bei will be rendered according to its meaning in a particular case; in discussions of bei in a more general sense, it may simply be transliterated.
complex of Dujiangyan in Sichuan, where canals dug in the third century B.C. are still visible, there is little about Anfengtang that would seem to qualify it for this status. Nothing of the ancient reservoir remains visible. Dikes built to retain the water were constructed from earth that has been carried away and replenished by man and nature for two millennia. Given the centuries of continued silting, the remains of the original Quebei 芍陂 dikes and reservoir are likely buried well below the present reservoir.3

The Traditional View

The important consideration in Anfengtang’s designation is not what the modern reservoir is but what it is thought to be—to wit, China’s most ancient reservoir and the work of Sunshu Ao 孫叔敖, the famous sixth-century B.C. statesman of Chu. Credit for Quebei has been accorded Sunshu Ao locally since the Eastern Han and nationally since the Six Dynasties. Consequently, he has been ranked with China’s greatest hydraulics experts since at least the Tang;4 Joseph Needham proclaimed, “Sunshu Ao ... ranks as the most ancient historical figure among all the hydraulic engineers of China.”5

While Quebei’s putative antiquity would no doubt have been sufficient to secure for it national recognition, it was also distinguished by its considerable size. The figures vary according to the source and time, but writers from the fifth century into the Song dynasty stated the diameter

3) In 1959, during the course of construction work on the Shi-Pi-Hang Irrigation Project 石淠杭灌溉水利工程, a headgate and artifacts dating from the Han were excavated at the site of the Anfengtang spillway. Cf. Yin Tiaofei 殷滌非, “Anhui sheng Shouxian Anfengtang faxian xianzai zhaba gongcheng yizhi” 安徽省壽縣安豐塘發現漢代閘壩工程遺址, Wenwu 1960.1: 61-62; Anhuisheng wenwu gongzuodui 安徽省文物工作隊, “Anhui wenwu kaogu gongzuoxin shouhuo” 安徽文物考古新收獲, in Wenwu kaogu gongzuo san shi nian 文物考古工作三十年, ed. Wenwu bianji weiyuanhui 文物編輯委員會 (Beijing: Wenwu chubanshe, 1979), 236.

4) When the Tang poet Fan Xun 樊珣 (fl. 777) praised the officials who had developed Fengyan Lake southwest of Jurong 句容, east of present-day Nanjing, he evoked the name of the chancellor of Chu—“In the past Sunshu Ao’s Quebei could expand the state of Chu”—and classed him with such luminaries of water conservancy as Shi Qi 史起, Zheng Guo 鄭國, Bai Gong 白公, Shao Xinchén 召信臣, and Du Shi 杜詩. See Fan Xun, “Fengyan hu jì” 綿巖湖記, in Quan Tang wen 全唐文 (Wuying dian 武英殿 ed., 1818), 445.14a-15a.

to be as much as 100 li (approx. 41.5 to 53.1 km according to the period), and the circumference to range from 120 to 324 li (51.6-139.3 km). Ancient Chinese sources put the area irrigated by the reservoir at as much as 10,000 qing, about 46,000 hectares. (These dimensions are discussed in more detail below.) It probably was not, however, very deep. Quebei was situated on a broad flat plain that slopes south to north rather than in the sort of steep valley where deep reservoirs are found.

No source earlier than the Eastern Han mentions Quebei, much less Sunshu Ao’s connection with it. Although Sima Qian places Sunshu Ao at the head of the “Biographies of Reasonable Officials” (“Xunli liezhuan”循吏列傳) in his Shiji, Quebei is noticeably absent both there and in the chapter on the Yellow River and canals (“Hequ shu”河渠書). Quebei does receive brief mentions in Ban Gu’s Hanshu, but the earliest source that specifically credits Sunshu Ao with the original construction of Quebei probably dates from the fifth century A.D. Despite a gap of several centuries between Sunshu Ao’s time and the first clear record, the attribution went largely unquestioned. Moreover, the conviction that

---

6) Units of measurement, including the li 里 and the mou 畝, were based on the chi 尺, the length of which grew from 23.2 cm in Western Han to over 30 cm in the Ming. The length of the li and the size of the mou grew accordingly; this will be reflected in the conversions given here. See Chen Mengjia, “Mou zhi yu li zhi”畝制與里制, Kaogu 1966.1: 36-37.

7) Joseph Needham gave the irrigated area as “eventually no less than 6,000,000 acres.” Chi Ch’ao-ting, whose work Needham cites in connection with Quebei, wrote that the reservoir irrigated 40,000 qing, which would be about two and a quarter million acres. Science and Civilisation 4.3: 271; Chi Ch’ao-ting, Key Economic Areas in Chinese History (London: George Allen & Unwin, 1936), 66-67. Neither gives a source for his figures.

8) HS, 28A.1568-69, 28B.1638. The first source definitely to associate Sunshu Ao with the reservoir is Wang Jing’s 王景 (fl. A.D. 83) biography in Fan Ye’s (398-445) History of the Later Han; no other source adequately corroborates it. In truth, the earliest version is probably that found in Wang’s biography in the Dongguan Hanji 東觀漢記, the origins of which date to the first century A.D. This was a basic source for Fan Ye’s HHS. The work is no longer extant but has been reconstructed from fragments. The pertinent passage from Wang Jing’s biography in the Dongguan Hanji was preserved in the early seventh-century encyclopedia Beitang shuchao 北堂書鈔. Later writers, however, generally refer to the HHS. See Beitang shuchao, comp. Yu Shinan 魏世南 (558-638) (1888 ed.; rpt. Taipei: Xinxing shuju, 1971), 74.5b; Dongguan Hanji jiaozhu 校注, ed. Wu Shuping 吳樹平 et al. (Zhengzhou: Zhongzhou guji chunbanshe, 1987), 18.774; HHS, 76.2466.

9) Only Li Daoyuan 離道元 (420-527) is thought to have had doubts. In his Annotated Classic of Rivers, he writes, “[Quebei] is said to have been created by Sunshu Ao” 試祠相孫叔敖所造. See Shuijing zhu 水經注 [hereafter SJZ], collated by Dai Zhen 戴震 (1724-77) (Wuyingdian junhen ban 武英殿聚珍版 ed.; rpt. Taipei: Yiwen yinshuguan, 1959), 32.7a. Several scholars have understood this to mean that Li Daoyuan did not accept the attribution to Sun as proven.
Sunshu was responsible for Quebei so influenced the interpretation of a passage in the Western Han text *Huainanzi* that Tang-time excerpts of the passage were modified to make the attribution explicit. The *Huainanzi* passage reads, “Sunshu Ao breached the Qisi river, and flooded the wilds of Yulou. King Zhuang [of Chu] understood [from this] that
he could be made chief minister” 孫叔敖決期思之水, 而灌雩婁之野. 莊王知其可以為令尹也.10 Beginning with an excerpt in the ninth-century Comprehensive Archive (Tongdian 通典), the Qisi River morphed into the Qisi Reservoir, which was then identified with Quebei. “The Liang dynasty established two commanderies: Chenliu and Anfeng. There is the Quebei reservoir that was created by Sunshu Ao of Chu. Cui Shi’s Monthly Ordinances [of the Four Classes] 四民月令 states, ‘Shu’ao made Qisibei reservoir.’ This is it” 梁置陳留, 安豐二郡. 有芍陂, 楚孫叔敖所起, 崔寔《月令》曰「叔敖作期思陂」, 即此.11 Consequently, when the Huainanzi passage was excerpted in Song dynasty compilations, it was similarly altered.12 By the Ming, steles erected at Quebei to commemorate repairs to the reservoir regularly traced its origins to Sunshu Ao; the claim was solidified with Xia Shangzhong’s Quebei Chronicle (Quebei jishi 芍陂紀事), which was compiled in 1801 and revised and published in 1877. Xia’s work became the standard account of the reservoir’s history.13

The belief that Sunshu Ao had initiated Quebei remained unchallenged until the 1970s. In the autumn of 1974, the Minister of Water Resources and Power declared that each jurisdiction from the province down to the county level was to compile histories of irrigation systems. In response, Anhui province formed a team to research the history of Anfengtang; it conducted a thorough examination of the textual evidence

---

10 Huainan honglie jie 淮南鴻烈解 (Siku quanshu ed.), 18.19b-20a.
12 For example, the Taiping yulan offers the following: “Shouchun Charts and Records says, ‘Quebei reservoir is in Anfeng prefecture.’ The Huainanzi says, ‘The chancellor of Chu made the Qisi reservoir and watered the Yulou fields.’ Further, the Yudi zhi: ‘Cui Shi's Monthly Ordinances [of the Four Classes] says that Sunshu Ao made the Qisi reservoir.’” 《壽春圖經》曰芍陂在安豐縣. 《淮南子》曰楚相作期思之陂, 灌雩婁之野. 又《輿地志》：崔寔《月令》云孫叔敖作期思陂, 即此是也. See Li Fang 李昉 (925-96) et al., Taiping yulan 太平御覽 (Taipei: Shangwu yinshuguan, 1968), 72.7b-8a. This passage is not found in reconstructions of Cui Shi’s work. How the conflation of Quebei and Qisi probably occurred is discussed by Shi Quan 石泉, “Guanyu Quebei (Anfengtang) he Qisi-Yulou guanqu (Qisibei) shijian wenti de yixie kanfa” 關於芍陂(安豐塘)和期思–雩婁灌區(期思陂)始建問題的一些看法, in Quebei shuilishi lunwenji 芍陂水利史論文集, comp. Zhongguo shuilishi yanjiuhui 中國水利學會水利史研究會, Shuili dianli bu zhi Huai weiyuanhui 水利電力部治淮委員會, Anhuisheng shuilishi yanjiuhui 安徽省水利史志研究會 (Hefei: Anhui shuili ting, 1988) [hereafter QBSLS], 67-85.
13 Quebei jishi 芍陂紀事 [hereafter QBSLS], comp. Xia Shangzhong 夏尚忠 (1877 preface); Li Sanmou 李三謙, “Quebei yu Quebei jishi” 芍陂與《芍陂紀事》, Nongye kaogu 2001.3: 170-74; Niu Zhongxun, “Xia Shangzhong de Quebei jishi” 夏尚忠的《芍陂紀事》, in QBSLS, 7-9.
and made field visits. Simultaneously, neighboring Gushi county in Henan organized a similar team, which challenged the Sunshu Ao/Quebei narrative. The crux of the difference was the Huainanzi passage already quoted, which they took to refer not to Quebei but to Sunshu Ao's activities further west in modern Gushi county. They convincingly argued that it referred to the location of the ancient town of Qisi in Henan, not to Anhui. The Huainanzi’s usefulness as evidence in favor of Sunshu Ao became problematical when Sun Jianming, in order to shore up the connection to Quebei, sought to undermine the Gushi case by declaring the passage in question to be a rhetorical fabrication. It was created, he claimed, to illustrate how a man such as Sunshu Ao might rise to prominence by dint of his own merit.

The details of the debate are rather complicated and warrant a separate study. For present purposes, it is sufficient to note that two narratives developed that were respectively dubbed “The Old Tradition” and “The New Tradition.” Briefly put, the Old Tradition held that Quebei dated

---

14 Sun Jianming 孫劍鳴, “Fangwen Anhuisheng Shouxian Sun Jianming tongzhi guanyu Quebei wenti” 訪問安徽省壽縣孫劍鳴同志關於芍陂問題, May 1, 1980. Transcription provided by Revolutionary Committee of Shouxian.


16 Sun Jianming 孫劍鳴, “Guanyu Quebei (Anfengtang) shijian shiqi de wenti” 關於芍陂(安豐塘)始建時期的問題, in QBSLS, 10-20. Sun’s point in fact is supported by a passage in Wang Chong’s 王充 (A.D. 27-c.100) Lunheng 論衡 that seems heretofore to have escaped notice. There, the anecdote appears almost verbatim with one about another individual whose early achievements foreshadowed later greatness. Wang was closely familiar with the Huainanzi and no doubt understood the original purpose of the reference. See Lunheng jiaoshi 論衡校釋, ed. Huang Hui 黃暉 (Taipei: Shangwu yinshuguan, 1964), 13.608; Harold D. Roth, The Textual History of the Huai-nan Tzu (Ann Arbor: Association for Asian Studies, 1992), 57.

17 The terms were coined by Sun Jianming, a Shouxian scholar and noted calligrapher, who made the case for Sunshu Ao. Sun, “Guanyu Quebei (Anfengtang) shijian shiqi de wenti,”
from the Spring and Autumn period and was the work of Sunshu Ao. The New Tradition, which was not so much a “tradition” as a cluster of alternative interpretations, found support from the noted historian Shi Quan 石泉, who asserted that, given the existing level of technology and the political/military situation at the time, Sunshu Ao could not have built Quebei. For the most part, this view held that Quebei originated from the Warring States period and was most likely the work of a certain Zisi 子思. Nothing is known about this person other than a brief fragment from the now lost third-century encyclopedia Huanglan 皇覽 that says, “The tomb of the Chu grandee Zisi is in the west of Shan district ... Zisi established Quebei reservoir.” At a conference held in 1986 at Shouxian, papers were presented on both sides of the question. Although the New Traditionalists presented a case that was as strong (or as weak) as that for Sunshu Ao, the Old Traditionalists were unmoved, and their view predominated. In Shouxian, the Old Tradition has become orthodoxy and is the sole version found at the local museum and in the Anfangtang Gazetteer published by the Anhui Provincial Bureau of Water Resources in 1995, as well as in other official publications. While the Gazetteer includes a list of the paper titles from the 1986 conference, it omits entirely any mention of the controversy.

A Reconsideration

As one traces the debate over the origins of Quebei, it is difficult not to conclude that proponents of both the Old and the New traditions have been overlooking something. Both sides have allowed themselves to be similarly constrained by their approaches to the question. The starting point for each is a brief reference in a fifth-century work, the Hou Hanshu, compiled nearly a thousand years after Sunshu Ao lived. Both sides begin from the assumption that Quebei dates from the pre-imperial period and seek to settle the matter with the same limited materials. Though they appear to address the same question—“Was Sunshu Ao responsible for Quebei?”—in reality the question they seek to answer is

18) That passage is found in the commentary by Liu Zhao (6th c.) to the treatise on administrative geography in Sima Biao’s 司馬彪 Treatises on the Continued Han (Xu Han zhi 續漢志, appended to the Hou Hanshu), 22.3486.
“How can the evidence be construed to support my view that Quebei is (is not) the work of Sunshu Ao?” The New group, having decided against Sunshu Ao, then tries to assign the reservoir’s origins to another time and person based on a reference that is equally tenuous. As for Sunshu Ao’s supporters, they believe that their view is further validated through repetition of the original assertion by later sources and (as we have seen) by construing the *Huainanzi* to support their position. Neither side brings fresh evidence to bear on the question. The result has been an expenditure of substantial amounts of ink and effort that in the end has done little to advance our understanding of Quebei’s early history.

Curiously, it seems not to have occurred to anyone to step back and begin anew with more fundamental questions: “When does Quebei first appear in the historical record and why not earlier?” More specifically, “What is the significance of its absence from the *Shiji* (or any pre-first century text), and what can be deduced from the brief entries in the *Hanshu*? What was the state of development of hydraulic technology, and where on the continuum of that development should Quebei be placed? What contextual or corroborative information is there to help date the reservoir’s origin?” Equally important, they have been reluctant to apply a simple basic tool of logic—the principle of parsimony (Occam’s razor)—that could do much to bring us closer to the real story.

The first mention of Quebei reservoir by that name, or any other, is in the “Treatise on Administrative Geography” ("Dili zhi" 地理志) of Ban Gu’s *Hanshu*. The bulk of Ban’s history, including insofar as we know the geography treatise, was completed by AD 83.19 There is no mention of the reservoir either by name or by any discernible oblique reference in a single pre-Qin text. There are, however, references to Sunshu Ao, to events in his life before he became chief minister to King Zhuang, and to his activities in that capacity.20 But among these, the absence of any reference to his having undertaken the construction of Quebei is striking. Surely, out of several references to his abilities as a

---

20 Sunshu Ao appears in the *Xunzi*, *Lüshi chunqiu*, *Mengzi*, and *Zuo zhuan*. These instances deal primarily with his putative humble origins, his rise to power, and his personal modesty while serving the King of Chu.
skilled and humane minister, at least one ought to have mentioned such an important example.

Even more telling is the lack of any mention of Quebei in the *Shiji*. As we saw, Sima Qian placed Sunshu Ao at the head of his chapter “Biographies of the Reasonable Officials,” and he even wrote that Sunshu had encouraged the people to exploit water resources, probably referring to the plants, fish, and wildlife that could be harvested. He did not, however, mention any role he might have played regarding Quebei.  

Equally significant is the lack of any mention of either Sunshu Ao or Quebei in the *Shiji*’s chapter devoted to flood control and water resources. Sima Qian’s “Treatise on the Yellow River and Canals” (“*Hequ shu*” 河渠書) is a general reflection of the importance of water resource concerns to early Chinese economic life and, more specifically, of the central place occupied by the Yellow River in the minds of Han rulers and administrators. Sima Qian’s decision to include this chapter was prompted by the disaster resulting from the Yellow River’s breaking its banks at Huzi in 132 B.C. and flowing southward into the Juye Marsh and the Huai and Si rivers. Herculean efforts to repair the breach failed and were abandoned as flouting the will of Heaven, which was considered to have ordained the breach. Then in 109 B.C., exploiting the opportunity presented by a drought, Emperor Wu ordered another effort to close it. When he came to inspect the work, the monarch commanded his ministers and courtiers to participate in the labor, and from generals on down they carried bundles of brushwood to close the breach. Sima Qian was apparently among them, and he describes the event.

But the treatise is not limited to flood control; it also details a number of important canal projects undertaken to irrigate large areas or to facilitate grain transport. Among the projects mentioned were, *inter alia*, some from the Warring States period in Chu and Cai—states that encom-

---

21) *Shiji* 史記 (Beijing: Zhonghua shuju, 1959) [hereafter SJ], 119.3099-3100; Burton Watson, *Records of the Grand Historian: Han Dynasty II* (rev. ed., New York: Columbia Univ. Press, 1993), 373-75; William H. Nienhauser, Jr., “A Re-examination of ‘The Biographies of the Reasonable Officials’ in the Records of the Grand Historian,” *Early China* 16 (1991): 216-22. Watson holds that each anecdote in this chapter was purposely selected by Sima Qian “to contrast with and satirize some policy or characteristic of official life under Emperor Wu.” It could thus be argued that the construction of Quebei by Sunshu Ao was not included because it would not have served that purpose, though that seems unlikely.

22) SJ, 29.1413; Watson, *Records*, 58.
passed or were near the Quebei area. Moreover, the treatise notes that in the mania for water projects in the wake of repairing the Huzi breach, Jiujiang commandery (the site of Quebei) diverted water from the Huai river for irrigation. The historian was proud of having visited many of the places where these projects were found and traveled the course of the more important rivers, including the Huai. Clearly, he was aware of the situation in Jiujiang and in the Huai river watershed. It seems reasonable, then, to conclude that he would have known about or perhaps even visited Quebei—if it indeed existed in his time. Why then was it omitted from his discussion? The simplest answer is that in Sima Qian’s time (say, prior to 100 B.C. or so) Quebei either did not exist, or had not yet achieved the size or importance that later writers assigned to it.

Ban Gu also included a treatise on flood control and water resources in the *Hanshu,* but he does not mention Quebei there either. The first part of his treatise follows Sima Qian closely, and the second part is devoted to Yellow River flood control. As noted, however, he does mention Quebei by name in his treatise on administrative geography, in two places. The administrative structure that he depicts in the latter treatise corresponds to the end of the Former Han or even to the reign of Wang Mang. (The census figures included by Ban are from A.D. 2.) Although he dates changes in the names and structure of the local administrative jurisdictions, he does not do the same for the local features—such as Quebei—that he includes. Thus, while he lists Quebei and a pair of offices—Reservoir Office (*beiguan* 陂官) and Lakes Office (*buguan* 湖官)—that may have been associated with the reservoir, there is no indication how long the reservoir had existed. Passing mention of Quebei under the entries for two commanderies (Lu’an and Lujiang) adjacent to Jiujiang, however, suggests that by the end of the Western Han it had

---

23 SJ, 29.1405-15, 130.3293; Watson, *Records,* 53-60. It may also be significant that there is no mention of Quebei in connection with the struggles between Liu Bang and Xiang Yu. In need of food to sustain their armies, they did fight over control of the Ao granary at Xingyang on the Yellow River. During similar struggles at the end of the Han, Quebei was contested because it was a rich grain-producing area. Sima Qian says that at age twenty he traveled the course of the Huai and Jiang (Yangtze) rivers. That would have been in about 126 B.C., a time when the coterie of scholars assembled by Liu An, king of Huainan, would have been active at Shouchun. It seems that given his innate curiosity and interest in learning, Sima Qian would have wanted to visit Shouchun, where he would have learned about Quebei.

24 HS, 29.1675-98.
already become a prominent landmark. Its importance is underscored by the establishment of an office—the Reservoir Office—that is found nowhere else.25

**Contextual Considerations**

Ban’s history provides us with a terminus ante quem for Quebei, but is it possible to be more precise? Without extensive archeological work, it is unlikely we can ever know when the first spadeful was turned to begin construction. However, it may be possible through careful examination of the historical context to determine approximately when Quebei developed into a significant component of a major irrigation system, if not when it was actually built.

Crucial to arriving at even an approximate date for Quebei is an understanding of the state of hydraulic technological development in early China. On this question, there are two considerations: water storage (i.e., dam or dike building) technology, and water distribution control (i.e., adjustable weir or sluice gate) technology. The leading proponent of the Old Tradition, Sun Jianming, asserts that the required technological level would not have been high and believes that construction of a reservoir in Sunshu Ao’s time, employing existing tools and taking advantage of the topography, would not have presented insurmountable problems. Another writer cited an instance in the philosophical text *Guanzi* of Chu’s blocking a pair of rivers to flood the fields

25 The noted Song historian Song Qi 宋祁 (998-1061), while serving as administrator of Shouzhou 阜州 in 1042, wrote: “Its large reservoir is called Que. Anciently it irrigated one million mou. The Pi River fed it. The Han established a Reservoir Office. Month in and year out it silted up, and the officials could not control it” 其大陂曰芍。古嘗溉百萬畝。渒水注焉。漢置陂官。歲廞月淤。吏不能治. Song does not mention the Lakes Officer, and he does not indicate his source, which differs from Ban Gu in that Ban does not specifically relate the Reservoir Officer to Quebei. It is not clear what might have been the relationship between the Reservoir Officer and the Office of the Directorate of Waters 都水官 at Quebei. Evidence (an iron mallet head inscribed 都水官) of the existence of the latter office at Quebei during the Han was excavated in 1959. HS, 28A.1569; Xi Han huiyao 西漢會要, comp. Xu Tianlin 徐天鄰 (jinshi 1205) (1935; rpt. Taibei: Shijie shuju, 1971), 33.342; Song Qi, “Shouzhou fengsu ji” 壽州風俗記, in Jingwen ji 景文集 (Siku quanshu ed.), 46.3a; Yin Tiaofei, “Anhui sheng Shouxian Anfengtang faxian xiandai zhaba gongcheng yizhi,” 61-62; Anhuisheng wenwu gongzuodui, “Anhui wenwu kaogu gongzuo xin shouhuo,” 236; Li Xiusong 李修松, “Liang Han shiqi Huaihe liuyu nongye shengchan shu lun” 兩漢時期淮河流域農業生產述論, Nongye kaogu 1999.1: 81.
of the state of Song as evidence that as early as 651 B.C. Chu possessed the necessary construction techniques. This example, paired with Chu’s achievements in city wall building, was presented as proof that Chu had the wherewithal to construct substantial dams for agricultural use.  

But building city walls—which were constructed of tamped earth （hangtu 夯土）—to keep people without is a far cry from building a dam to contain millions of cubic meters of water within. The same is true of blocking a river merely to flood fields to a depth sufficient to prevent cultivation and hinder communication. Neither is it a simple matter to distribute stored water and regulate its flow. Proponents of the Old Tradition have taken great pride in noting that Sunshu Ao’s reservoir preceded ancient China’s other famous irrigation projects—Ximen Bao’s diversion of the Zhang River 漳河 (in modern Henan), the Dujiangyan 都江堰 (in modern Sichuan), and the Zheng Guo canal 鄭國渠 (in modern Shaanxi)—by 200 to 350 years. Guiding water flow from a river into a distribution network of canals and ditches is quite different from storing large quantities behind artificial barriers and then releasing it in controlled amounts. It seems not to have occurred to these writers that the dates of the later projects are perhaps an indication that the techniques for planning and constructing complex canal/ditch systems were not fully developed until then.  

In addition to these better known projects, to show that Chu was capable of a sophisticated irrigation complex Liu Yutang points to an anecdote from the Han text Yue jue shu 越絕書, which describes a rather involved system of canals and ditches that was constructed by the Warring States official Lord Chunshen 春申君 (d. 238). Liu, “Chuguo shuili sheshi yu jianshe gaishuo,” 147, and Chuguo jingjishi, 72. Significantly, in discussing the development of reservoirs, the agricultural historian Zhang Fang states that Quebei was the earliest, being built about 600 B.C., but then she jumps to Han projects in Hanzhong, Runan, etc., during the reign of Emperor Wu. Though she admits there is no pre-Han evidence to support the existence of Quebei, she says that it can be taken as an example of the earliest stage of the development of the irrigation reservoir. She does not account for the temporal gap, which may suggest that the technology for a project of such scope did not really exist until the mid Western Han.  


The question of technology was taken up in an article by Xu Shichuan of the Water Conservancy Bureau of Huaiyin, Jiangsu. Xu concluded that the requisite technology—by which he referred in particular to dikes or dams able to retain large amounts of water and to durable head gates—did not yet exist in Sunshu Ao’s time. For a large reservoir, both dikes and sluices would have had to withstand considerable pressure as well as the erosive forces resulting, among others, from the action of waves whipped up by wind across the broad surface of the water.28 Building dikes would not have been a simple matter of piling up rocks and dirt for a near-term purpose but, as Xu points out, would have required knowledge of hydraulic principles and construction materials. As for adjustable weir gates, Xu believes they may have been in existence by the reigns of Emperor Wen (r. 179-147 B.C.) or Emperor Jing (r. 156-141 B.C.), but not much before.29 Even the late Joseph Needham, who was prone to push Chinese precedence in technological innovation, could only say they were introduced during the Qin or Western Han, “if not before.” But he also wrote that it might be significant that such gates were not mentioned by Sima Qian, though Ban Gu did refer to them.30 Additionally, the Taiwan historian Huang Yaoneng has pointed

28 After the rebuilding of the dikes at Anfengtang that was part of the reconstruction process started in 1958 was completed, the reservoir could hold 100 million cubic meters. But when it was filled to capacity (to a depth of 28.5 meters), winds reaching a mere 10 km/hr. were enough to severely damage the dikes, eroding an estimated 500,000 m³ of soil. This reduced the reservoir’s capacity to less than half. Reinforcement of the dikes was decided and by 1966 fifteen kilometers had been done. Then in 1976, some 110,000 men and women were mobilized over the course of two winters and one spring to haul stone from Eight Excellencies Mountain (Bagong shan 八公山) some 45 km away. They reinforced twenty-four kilometers of the dike against the waves, using a total 66,000 m³ of stone. See Anfengtang zhi, 24, 25, 35; Shouxian zhi 壽縣志, ed. Shouxian difangzhi bianzuan weiyuanhui (Hefei: Huangshan shushe, 1996), 173.

29 Xu Shichuan 徐士傳, “Sunshu Ao zao Quebei shi fuhui zhi tan” 孫叔敖造芍陂是附會之談, Nongye kaogu 1986.2: 181. It will be useful to distinguish between sluice gates and weirs. A “sluice” is a water channel controlled by a head gate. A “sluice gate” controls water by regulating the amount it allows to flow under it. A weir gate controls water by regulating the amount that flows over it. Unfortunately, Chinese terminology for the period dealt with here does not allow a precise understanding of which is being referred to in a particular case.

30 Needham, 230, 344-46. The remains of a large (15 meters wide) flash lock (zhashi 閘室) excavated in Guangzhou in 2000 and dating from the kingdom of Nan Yue in early Western Han times is impressive evidence of the level of development of such gates during the Han. However, this gate was used to control the flow from the Pearl River rather than contain a large volume of stored water, which one may doubt it would have been able to do as it was made entirely of wood. Chen, Zehong 陳澤泓, “Nan Yue guo Panyu cheng xilun”
out that the iron tools necessary to such an undertaking were not yet in use in Sunshu Ao’s time, and he makes a strong case that agriculture and thus irrigation were poorly developed in Chu.31 In short, a reservoir on the grand scale for which Quebei later became known is not likely to have been possible until about the beginning of the reign of Emperor Wu (r. 140-87 B.C.) of the Han.32

If the state of hydraulic technology suggests a probable Han dating for Quebei, what about the political context? The Han kingdom of Huainan (later Jiujiang commandery) was an integral part of a generally peaceful empire and was ruled by scions of the imperial family. But it was also characterized by the independent inclinations of its rulers and population. Of its four kings, the first, who was not a member of the imperial family, and the second, Liu Chang, had rebelled. Liu Chang’s son, Liu An, became the fourth king, and like his father he believed he had a strong claim to the imperial throne. At his capital Shouchun he developed what was essentially a competing court. As Emperor Wu was moving to establish an intellectual orthodoxy through the creation of a

---

31 Huang Yaoneng 黃耀能, Zhongguo gudai nongye shuili shi yanjiu: Zhongguo jingji shi yanjiu zhi yi 中國古代農業水利史研究：中國經濟史研究之一 (Taibei: Liuguo chubanshe, 1978), 63-64; according to Huang, the earliest mention of irrigation in Chu dates to 548 B.C., and that refers to wells. Li, “Liang Han shiqi Huaihe liuyu nongye,” 78, credits the rapid development of agriculture during the Han to the improvement in iron tools and their dissemination.

32 It was suggested by Liu Bin 劉攽 (1023-89), the Song dynasty historian and Han expert, that the Qimen Sanyan 七門三堰 reservoir was built by Liu Xin 劉信, who was appointed Noble of Gengjia 羹頡侯 by his uncle Han Gaozu in 200 B.C. (The rendering of hou 侯 as “noble” follows the usage introduced by Michael Loewe.) This would have been earlier than Quebei. Previously, Liu Fu had been credited with creating the reservoir as part of his development of military agricultural colonies (tuntian 屯田) for Cao Cao in about 205—in other words, some four centuries later. After he had been assigned to an unspecified minor clerical position in Luzhou and while he was examining the archives, Liu Bin became interested in the story. He discussed it with local elders, who claimed the reservoir to be the work of Liu Xin, not Liu Fu, who had only repaired it. In a process redolent of the Sunshu Ao attribution, Liu Bin composed his “Chronicle of the Qimen sanany” based on this oral tradition for a temple erected to honor Liu Xin. Thereafter, the attribution to Liu Xin became the accepted version and was repeated in Zheng Qiao’s 鄭樵 (1104-62) Wenxian tongkao 文獻通考 and in the Kangxi-era Jiangnan tongzhi 江南通志. See Liu Bin, “Qimen miaozhi” 七門廟記, in Song wenjian 東文鑑 (Siku quanshu ed.), 81.8b; Wenxian tongkao (Siku quanshu ed.), 6.2a-b; Jiangnan tongzhi (Siku quanshu ed.), 32.24a-b.
system of scholars specializing in the interpretation of the Classics, Liu An too gathered about him a coterie of savants of a Daoist bent who were interested in a wide range of subjects, including cosmology, rulership, and literature. In addition to works on a variety of subjects, they produced the *Huainanzi*, one of the most important philosophical texts of the Han period. Liu also built up a military force and manufactured arms, appointed men as nobles (*hou* 侯), an imperial prerogative, and otherwise conducted himself as the emperor he thought he should be. Ultimately, in 122 B.C. he was accused of plotting rebellion and committed suicide before the imperial officials sent to punish him could arrive; the kingdom of Huainan was abolished and replaced by Jiujiang commandery.33

Liu An's tenure as king of Huainan would seem to have been a particularly suitable moment for a project such as Quebei. He desired to strengthen his kingdom and his power. Improving grain production would have been important to building an army and could produce income for his other activities. Moreover, he had assembled a group of men who seemed to have the vision for such a project. Yet, despite all the attention he and his kingdom received from Sima Qian (who may have visited the area a few years before the rebellion) and Ban Gu, there is no suggestion in either of their histories of a large reservoir feeding extensive fields. Neither is there any hint of it in the *Huainanzi*, though as we shall see there are allusions to stored-water field irrigation. There have been various, occasionally creative explanations as to why this is so.34 But if one simply applies the principle of parsimony, the likely explanation becomes immediately apparent: Quebei, at least as the large reservoir it became known as, did not yet exist when Sima Qian wrote.

Is it possible, then, to know when the reservoir in fact did come into existence? Probably not, though one can hazard a reasonable estimate.


34) Sun Jianming asserts that the *Huainanzi* in fact says nothing about any event that occurred at Shouchun. His explanation is that the text’s authors fabricated anecdotes to make their points, and if something had been made up about nearby places, it would have been easily exposed. Sun, “Guanyu Quebei (Anfengtang) shijian shiqi de wenti,” 13.
We know, for example, from the mention in Ban Gu’s “Treatise on Geography” that Quebei existed by the end of the Former Han and that it was of sufficient size to receive water from the combined flows of the Rugu and Pi rivers. Moreover, it was large enough that the unique positions of Reservoir Office and Lakes Office may have been specifically created for it. Thus, one can estimate that Quebei became a reservoir of significant size sometime between, on the one hand, either the end of the kingdom of Huainan (122 B.C.) or the completion of Sima Qian’s *Shiji* (at some point in the 90s B.C.), and, on the other hand, the year of the census figures in Ban Gu’s treatise (around A.D. 2).

It may in fact be possible to narrow the time even further. In his “Treatise of the Yellow River and Canals,” Sima Qian (echoed by Ban Gu) says that in the wake of the successful closing of the Yellow River breach at Huzi, in 109 B.C.,

the men who were concerned with such affairs all rushed to the emperor with proposals for utilizing the rivers to greater advantage. As a result canals were dug in Shuofang, Xihe, Hexi, and Jiuquan to draw off water from the Yellow River or smaller rivers in the valleys and use it to irrigate the fields. Within the Pass the Fu and Lingzhi canals were constructed, making use of the water of the various rivers of the region; *in Ru’nan and Jiujiang water was drawn from the Huai River;* [in] Donghai from the marsh of Juding; and at the foot of Mt. Tai from the Wen River. *In all these places canals were dug to water the fields, providing irrigation for over 10,000 qing of land in each area.* In addition, many other small canals and waterways through the mountains were opened up, but they are too numerous to describe here. Of all these exploits, however, the most outstanding was the closing of the break in the Yellow River at Xuanfang.35

自是之後,用事者爭言水利。朔方、西河、河西、酒泉皆引河及川谷以溉田；而關中輔渠、靈軹引堵水；汝南、九江引淮；東海引鉅定；泰山下引汶水；皆穿渠為溉田，各萬餘頃。佗小渠披山通道者，不可勝言。然其著者在宣房。

The simplest explanation for the origin of Quebei, then, is that it was built—or significantly expanded—during the mania for waterworks that followed repair of the Huzi breach, when bureaucrats apparently saw water projects as a way to make their mark and gain advancement.36

---

35 *SJ*, 29.1414 (emphasis added); see also *HS*, 29.1684; Watson, *Historical Records*, 59-60.
36 Xu Hailiang makes a similar point concerning the construction of dikes/reservoirs in nearby Runan commandery. Xu Hailiang 徐海亮, “Gudai Runan beitang shuili de shuaibai”
This hypothesis gains support from the case of Shao Xinchen 召信臣, an exemplary official and a native of Shouchun. In about 40 B.C., Shao was appointed grand administrator of Nanyang commandery, which lay some 400 km northwest of Shouchun. Like Sunshu Ao centuries before, he was noted because of his concern for the welfare of the people and for the promotion of agriculture. Particularly relevant to the present discussion is the attention he paid to irrigation. He constructed the Qianlu reservoir 鉗盧陂, whose dikes he built by piling up stone, while “on the sides he installed six stone gates to regulate the water flow” (傍開六石門以節水勢). In 34 B.C., he replicated this method on the Tuan River 湣水 by constructing the Rangxi stone dam 穰西石堨. This dam seems to have originally had three stone sluices, for the Annotated Classic of Waters states that in A.D. 5 another three gates were added and the dam was called Six Gate Dam 六門堨.

The use of stone for the dikes and the head gates is significant, because it suggests that Shao had addressed the need to withstand the considerable pressure of a large amount of water as well as the erosive forces mentioned by Xu Shichuan. The texts provide no detail of how the sluices were designed; probably they comprised a stone box set into the top of the dike that was either grooved or otherwise fashioned to hold stop logs in place against the water pressure. When the reservoir neared capacity, stop logs could be added or removed to regulate water level and outflow. But where had Shao learned these techniques? It would seem natural to conclude that he had observed them already at work back home at Quebei. This suggests that by 40 B.C. the technological conditions...
necessary for Quebei to attain its largest dimensions and to irrigate a large area (10,000 qing, or 46,000 ha., is the usually cited figure) had been met. Thus, the existence of ancient China’s largest irrigation reservoir most likely dates from the early to mid-first century B.C.—too late to be mentioned by Sima Qian but in time to be introduced by Ban Gu.40

Aside from the two references in Ban’s geography treatise already mentioned,41 Quebei is not otherwise mentioned in the *Hanshu*. Most notably, it is missing from Ban’s discussion of hydraulics in his “Treatise on Watercourses and Canals” (“Gouxu zhi” 溝洫志, juan 29). While this has perplexed adherents of the Old Tradition, it is not surprising. Most likely the reason Quebei was not singled out for mention at this point was that it simply was one of many projects of similar or even greater scale. The total area served by Shao Xinchen’s Qianlu reservoir is said to have grown to 30,000 qing, and the restoration of the Hongxi Reservoir 鴻郤陂 ordered by Runan administrator Deng Chen during the Jianwu era (25-56) resulted in a dike more than 400 li long.42 The

---

40 Some perhaps circumstantially corroborative evidence for this dating are the coins uncovered in the Han-period gate-dam excavated in 1959. Found were coins from the Qin, Western Han and Wang Mang periods. Their presence has been considered as confirming an Eastern Han date for the gate. See Yin, “Anhui sheng Shouxian Anfengtang faxian xiandai zhaba gongcheng yizhi,” 61–62; Anhuisheng wenwu gongzuodui, “Anhui wenwu kaogu gongzuo xin shouhuo,” 236.

41 See note 8 above.

42 Hongxi Reservoir, which was in Runan commandery, had existed at least from the end of the Western Han. During the reign of Emperor Cheng (r. 32–6 B.C.), the original reservoir had been destroyed by Minister Zhai Fangjin 翟方進 because of the danger of its bursting and causing flooding. He believed also that the exposed land would be fertile and the cost of maintaining the dike would be saved. It was widely believed, however, that Zhai himself
special notice given Quebei in the late Han and post Han period was due not so much to its scale or complexity of construction as to its proximity to Shouchun, which gave the reservoir tremendous strategic significance. But acknowledging this begs the question: Did Quebei not exist in any form prior to the reign of Emperor Wu? And if so, in what form? To answer these questions, it is necessary to understand the evolution of the meaning of the term bei陂.

Bei Deconstructed

I have alluded to the possibility that the Quebei of history might have resulted from the expansion of an earlier, smaller body of water. The reservoir occupied a depression around which dikes were constructed to increase capacity. One can reasonably surmise that the original depression collected water from rainfall, ground water, and smaller streams or springs to form a wetland or even a kettle lake, a common feature in the region. The topography (sloping south to north from the Dabie Mountains to the Huai River, with large depressions nearer the river), geology (a high water table fed by underground water from the mountains), and high rainfall (particularly in the summer) fostered such features. One of the early meanings of bei was the dike or berm around a marsh to hold the water. Another meaning given for the same graph was “pond” (chi池), and it was described as a depression into which water flowed wanted that land for cultivation. As with Quebei, the dikes were built taking advantage of the topography. See HS 84.3440; HHS 82A.2710.

43) Situated at a major junction of the Huai River and an important route between Chang’an and Luoyang in the north and the Jiangnan region in the south, Shouchun assumed great strategic importance from the time of the struggles among the various warlords in the final years of the Han through the Three States and Six Dynasties periods. See Xu Yitang, “Xiangyang yu Shouchun zai nanbei zhanzheng zhong zhi diwei”襄陽與壽春在南北戰爭中之地位, Zhongguo wenhua yanjiu huikan 中國文化研究會刊 8 (1948): 58-64; Kong Weilian 孔為廉 (William Gordon Crowell), “Bingjia bi zheng de Shouchun: lishi xingxiang de xingcheng yu zhuanbian”兵家必爭的壽春：歷史形象的形成與轉變, Hanxue yanjiu 漢學研究 30.1 (2012): 93-129.

45) E.g., SJ, 42.1772, 1774 n. 15, giving the gloss by Fu Qian 服虔 (late second century) to the line 臺駘能業其官,宣汾、洮,障大澤 as: 「陂, 障其水也」. Similar glosses are found throughout the Shiji and other Han and pre-Han received texts.
forming a lake” (湖 hu). The graph often occurs in combination with “pond” 池 and “marsh” 澱. Bei were comparatively small; the second-century lexicon Shuowen defines a lake as a large bei (湖, 大陂也).

From very early times, these were important places for gathering food, be it water fowl, fish, small animals, water plants or herbs, and they are mentioned in this connection, for example, in the Odes. (It may be worth noting in this regard that one meaning given for the graph 陂 is “water chestnut.”) References in the Odes to such ponds being used to water crops have been judged to refer to the Western Zhou, but the scale is believed to have been small and likely to have involved carrying the water or employing simple ditches. As an important natural resource, during the Han bei were considered to belong to the emperor and access to them was carefully controlled. The mythic Yellow Emperor himself was said to have first taught the people the proper utilization of bei and other natural resources (such as rivers, lakes, marshes, mountains, forests, plains and wetlands) according to the season. During famines these areas might be opened up to the populace as a relief measure. Their value was such that bei were developed privately by the wealthy, and they could be taxed like other natural resource lands, with the proceeds going to the privy treasurer for the emperor’s use.

---

46 Wang Zhen’s Nongshu cites the Shuowen as stating, “A bei is a natural pond” 陂，野池也. This passage is not found in the current version of the Shuowen. See Wang Zhen 王禎, Nongshu 農書 (Siku quanshu ed.), 18.6b; Nongzheng quanshu jiaozhu 農政全書校注, comp. Xu Guangqi 徐光啓 (1562-1633), annot. Shi Shenghan 石聲漢 (Shanghai: Shanghai guji chubanshe, 1979), 17.419; Xu Shen 許慎 (c. 58-c. 147), Shuowen jiezi zhu 說文解字注, annot. Duan Yucai 段玉裁 (1735-1815) (1808, rpt. Taibei: Shijie shuju, 1962), 14B.1a.

47 Shuowen jiezi zhu, 11Ab.4b-5a.


49 Shuowen jiezi zhu, 1B.8a. The pronunciation and the meaning of the graph are worthy of a short study in themselves, though the conclusion would be no more certain than the origins of the reservoir. See n. 2.


52 SJ, 6.270 n. 2, citing Ying Shao 應劭 (second century).
It will be recalled that in describing the fad for water resource and flood control projects that followed the repair of the Yellow River breach, Sima Qian said that “in Runan and Jiujiang water was drawn from the Huai River.” Juxtaposing this statement to another one in the Huainanzi that offers “using the Huai to water the mountains”\(^{53}\) as an example of going against the natural flow of things, a tantalizing possibility presents itself. One can imagine that having tried to draw water from the Huai river for irrigation as had been done elsewhere, officials realized that it would be easier to redirect water from the rivers flowing from the mountains to fill a catchment basin. The capacity of the basin would then have been substantially increased by dikes fitted with recently developed adjustable weirs set in stone boxes. A supply of water sufficient to keep it filled would have been assured by excavation of the Ziwu canal 子午渠 to draw from the Pi river to the west.\(^{54}\)

Significantly, the Huainanzi is the first Han source to clearly associate bei with field irrigation, though it does not mention Quebei in this connection.\(^{55}\) Chapter 11 states, “It is like using the same reservoir bei to


\(^{54}\) The lack of any reference to a stone box in reports on the excavation of the Han-dynasty head gate uncovered at Anfengtang in 1959 need not mean that stone was not employed there. In an area where stone was not plentiful, one should expect that after the gate fell into disuse the stone was removed for another use. Yin, “Anhui sheng Shouxian Anfengtang faxian xiandai zhaba gongcheng yizhi,” 61-62; Anhui sheng wenwu gongzuodui, “Anhui wenwu kaogu gongzuo xin shouhuo,” 236.

\(^{55}\) Of the forty-four occurrences of the graph 陂 in the Shiji and the seventy-eight in the Hanshu, none clearly suggests that bei were used for field irrigation. The graph occurs either as part of a name or to indicate a pond, often used as a source for natural products or for pleasure, as in the case of the imperial parks. Even formulaic references such as bei chi tian yuan 陂池田園 only show that fields and bei were considered categorically similar but do not reveal any necessary practical connection between them. We should guard against allowing, as some have (e.g., Huang, Zhongguo gudai nongye shuili shi yanjiu, 159), our knowledge of how bei operated in later times to skew our understanding of the situation in early Han. Shao Xinchen’s HS biography, while mentioning his construction of weir gates in Nanyang commandery, does not mention the name of any bei: that is supplied in the Tongdian. The Zhouli, while not using the term bei, appears to describe the storage of water for use in rice field irrigation. At least that is how it was understood by the Later Han commentator Zheng Xuan 鄭玄 (127-200), who does use the term in a gloss. See Zhouli zhushu 周禮注疏 (Siku quanshu ed.), 16.12a; Le Tcheou-li ou Rites des Tcheou, trans. Édouard Biot (1851; rpt. Taibei: Ch'eng-wen Publishing Co, 1969), 1.366-68. Zheng’s view was questioned by Qing scholars; but Okazaki Fumio has reasonably suggested that he was simply interpreting the text in light of practices in his own day. Okazaki Fumio 岡崎文夫,
irrigate [several] fields; the water each receives is equal.”56 In Chapter 17 we find, “A reservoir of ten qing (1 qing = 46 ha.) can water forty qing, but a reservoir of one qing cannot water four qing.”57 While these passages do not speak directly to the question of Quebei, they do suggest that bei were being used for field irrigation by the time these sections of the text were compiled.58 That a shift in the function of bei from aqua-

56 Huainan honglie jie, 11.14b; Liu and Major, Huainanzi, 415.
57 Huainan honglie jie, 17.7b; Liu and Major, Huainanzi, 679.
58 The version of the text presented to Emperor Wu was likely completed in large part prior to his accession to the throne in 141 B.C. However, it is also possible, and perhaps probable, that the text continued to be revised and that a redacted version was produced by the imperial bibliographer Liu Xiang 劉向 after the death of Liu An and the confiscation of his library. Thus, all we can safely say is that the cited passages described practices current by the death
culture to irrigation was widespread is further suggested by a passage from the late second-century text *Fengsu tongyi* explaining the term *bei*:

The *Tradition* states, “*Bei* means ‘profuse.’ This means that because water collects in low spots, there is a bounty of the myriad things.” At present the *bei* are all used for irrigation. Present Runan commandery’s Fubei 富陂 prefecture is an instance.”

No doubt this describes what happened with Quebei as well. In any event, it should caution us that an understanding of the proper meaning of *bei* is a complex matter and that the term did not necessarily mean the same thing in Spring and Autumn times as in the Han and later.

While *bei* had played an important role in food production from early times, Huang Yaoneng, in a closely argued study, concludes that they did not become important for irrigation until the mid-Western Han. Emperor Wu had invested hugely in river-fed irrigation canal systems, especially in the Guanzhong region. But the high costs and excessive manpower demands, coupled with the enormous costs of the emperor’s expansionist military campaigns, forced abandonment of such ambitious projects. The result, according to Huang, was a growing interest in less costly and smaller-scale stored-water (i.e., *bei*) irrigation projects undertaken privately. In the early stages these systems were pretty much limited to Runan and Nanyang commanderies. Then, beginning with the reigns of the first three Eastern Han emperors—Guangwu (r. 25-57), Mingdi (r. 57-75), and Zhangdi (r. 75-88)—the use of *bei* began to spread south- and eastward into the Huai and Yangzi watersheds. They were largely developed privately by the wealthy; later, their repair and

---

59) *Fengsu tongyi* 風俗通議 (*Siku quanshu* ed.), 10.7b-8a; *HS*, 28A.1561, and *Hou Hanzhi*, 20.3424, both give the name of this prefecture as 富陂. Wang Xianqian says 富陂 and 陂 are used interchangeably: see *Hanshu buzhu*, 28A.2a. The *Tradition* cited here is unknown. On the numerous *bei* found at Fubei (hence the name), see Huang, *Zhongguo gudai nongye shuili shi yanjiu*, 210-11.

60) Since the 1980s, based on archeological data, PRC scholars have concluded that by the Qin-Han period dikes and reservoirs had become an important part of irrigation infrastructure. See Yan Xueping 晏雪平, “Ershi shiji bashi niandai yilai Zhongguo shuili shi yanjiu” 二十世紀八十年代以來中國水利史研究綜述, *Nongye kaogu* 2009.1: 188.
construction was undertaken by government officials. Down to the reign of Andi (r. 106-125), they expanded from the upper reaches of the Huai river watershed further eastward to the coast. During this latter period, Huang concludes, development of the bei reached its apogée.61

During the Eastern Han, bei proliferated and were found in a wide range of sizes from a few hundred paces (bu 步; 1 bu = approx. 1.4 m) in circumference to a few hundred square kilometers in area. Li Daoyuan recorded over 270 examples in his Shuijing zhu. Many of these were simply natural bodies of water and thus not part of any irrigation project.62 But even those that were used for irrigation continued to be employed as well for raising fish, fowl, frogs, herbs, water plants, and the like. This is graphically illustrated by a pottery model of what appears to be a bei—complete with sluice gate—that provides water to a pair of fields. Within the bei are figures of fish, frogs, snails and others.63 Some-

---

61 Huang, Zhongguo gudai nongye shuili shi yanjiu, 154-66, 201-28. According to Okazaki Fumio, the method of building dikes to store water would have been necessary to growing rice in the drier climate of North China. Okazaki, “Shina kodai no tōbei inasakō kō,” 45-47. Itō Toshio suggests that beginning with the civilian agricultural colonies (tuntian) established by Cao Cao, stored water irrigation based on bei was developed south of the Yellow River. Itō Toshio 伊藤敏雄, “Sō Gi tonden to suiri jigyō” 曹魏屯田と水利事業, in Saitō Hakushi 佐藤博士退官記念中国水利史論叢, ed. Chūgoku suirishi kenkyūkai 中国水利史研究会 (Tokyo: Kokusho kankōkai, 1984), 89.

62 See Chen Qiaoyi 陳橋驛, Shuijingzhu yanjiu 《水經注》研究 (Tianjin: Tianjin guji chubanshe), 224-25. The administrative records on bamboo and wooden strips recovered at Zoumalou, Changsha, include a “Register of the Length, Depth and Area of Dried Up Reservoirs” 枯兼波 表 and provide valuable and concrete evidence of this proliferation. The strips record the length, width, and depth for a number of smaller bei. For example, strip 3.6320 gives the dimensions for the Tingxiabei 亭下陂 as 4 m deep, 46.3 m long and 83.4 m wide; strip 3.7221 gives the length of Fengtangbei 逢唐陂 as 694 m. These bei had been primarily for irrigation. For more details see the discussion of the register in Shen Gang 沈剛, “Zoumalou Sanguo Wu jian bokujian bu tantao” 走馬樓三國吳簡枯兼簿探討, Zhongguo nongshi 2009.2: 3-8; Sun Wenbo 孫聞博, “Zoumalou Wu jian ‘kujianbo’ chutan” 走馬樓簡‘枯兼簿’初探, http://www.bsm.org.cn/show_article.php?id=1417 (accessed 7/14/2011); Wang Zijin 王子今, “Zoumalou zhujian ‘kujian bo bu’ ji qi toulu de shengtai shi xinxi” 走馬樓竹簡‘枯兼波簿’及其透露的生態史信息 Hunan daxue xuebao 2008.3: 38-40. Unpublished reports of strips found elsewhere suggest that the use of bei was widespread.

63 This burial object was recovered in 1978 from a Han tomb in Mian county 沔縣, Shaanxi. See Chūgoku tonō no bi 中國陶傭の美 (Tokyo: Asahi shimbun, 1984), 136, pl. 36. Similar models have been found in other graves. See, for example, Qin Zhongxing 秦中行, “Ji Hanzhong chutu de Handai beichi moxing” 記漢中出土的漢代陂池模型, Wenwu 1976.3: 77-78; Guo Rongchang 郭榮章, “Handai de beichi” 漢代的陂池, Kaoqi ya wenwu 1991.5: 109-10; Xiao Minghua 蕭明華, “Beichi shuitian moxing yu Han Wei shiqi Yunnan de
times, numerous smaller bei might be “daisy chained” together to better control water flow and extend capacity.\(^{64}\)

As with many things, quantity did not promise quality, and many bei fell into disuse or failed. Records from the “Register of the Length, Depth and Area of Dried Up Reservoirs” found among the bamboo strips uncovered at Zoumalou list bei that had become empty and could be converted into land for cultivation.\(^{65}\) While one writer has suggested that these reservoirs dried up because of the climatological changes that occurred from the Later Han on, poor siting of the dikes/dams, inexpert construction, and indifferent maintenance probably also played a large part.\(^{66}\) By the Western Jin, the widespread construction of bei was often so inferior that their benefits were outweighed by the damage caused by floods whenever they burst. Steps were ordered by the central govern-

---

64 On the number of large reservoirs at the end of the Later Han, see Wei Xinmin 魏新民, “Shixi Sanguo Wu jian bokuijuan bu tantao,” 7. For an overview of the archeological evidence for irrigation tanks, see Zhongguo kaoguxue: Qin Han juan 中國考古學: 秦漢卷, ed. Zhongguo shehui kexueyuan kaogu yanjiusuo 中國社會科學院考古研究所 (Beijing: Zhongguo shehui kexue chubanshe, 2010), 595-96. While these tomb models can offer an instructive glimpse of material life during the Han, we must not forget their original purpose as funerary objects. Mostly crude and merely representative, they were not intended to be scale models of existing infrastructure. Thus, Qin Zhongxing’s suggestion that the curved dam in a model of an irrigation tank and paddy field recovered in Hanzhong xian 漢中縣, Shaanxi, depicts an intentional design to deflect water pressure toward either side of the dike cannot stand in the absence of other examples or of textual references demonstrating an understanding of the hydraulic principle involved. In this case, the curvature surely reflects the crude nature of the pottery rather than sophisticated hydraulics. Qin, “Ji Hanzhong chutu de Handai beichi moxing,” 78; Zhongguo shehui kexueyuan kaogu yanjiusuo, 595-96. Zhang Heng’s “Southern Capital Rhapsody” also seems to describe the dual use of bei. See David R. Knechtges, Wen xuan or Selections of Refined Literature, vol 1: Rhapsodies on Metropolises and Capitals (Princeton: Princeton Univ. Press, 1982), 319-21.

65 See note 62 above.

66 Wang, “Zoumalou zhujian ‘kuchan bo bu’ ji qitoulu de shengtai shi xinxi,” 38-40. For a summary of studies on climatological change in this period, see Connie Chin, “Climate Change and Migrations of People During the Jin Dynasty,” Early Medieval China 13-14.2 (2008): 49-60. While there is no question that climatological change occurred from the late Han to the Tang, the evidence is primarily for North China. Whether the impact in the Yangtze watershed would have been enough to cause the reservoirs to dry up remains an open question.
ment to drain them and reduce their numbers. Quebei, however, was too large, and too important because of its proximity to the strategic city of Shouchun, to be abandoned; maintaining it would become of paramount concern for successive regimes under the Six Dynasties.

**Dimensions and Shape**

Quebei was distinguished not just by its antiquity but also because of its considerable size. The original dimensions of Quebei are not known, and its precise location is thus uncertain. The earliest mention of the scale of the reservoir appears in Li Daoyuan’s *Shuijing zhu*, which was written a millenium after Sunshu Ao supposedly constructed Quebei. The author of the *Quebei jishi*, Xia Shangzhong, assumed that Sunshu Ao’s reservoir looked pretty much as Li described it for his time, and in the same way modern supporters of the Old Tradition mostly seem to believe it originally had the dimensions given by Li. Yet, there is no evidence that this was so.

Li Daoyuan gives the circumference as 120+ *li*. If the reservoir were circular (which is not likely, but its exact shape is unknown), this would have made its diameter about 38 *li* and its surface area approximately 1,146 square *li*, or close to 20,000 hectares. The dimension given by Tang and Song sources is a diameter of 100 *li*. The *late-Qianlong Da Qing yitong zhi* cites the Maps and Gazetteer of the Commanderies and Counties in the Yuanhe Period (*Yuanhe junxian tuzhi* 元和郡縣圖志) of 813 as giving 324 *li* for the circumference and a diameter of 100 *li*. Hu Sanxing 胡三省 (1230-1302) quotes in his commentary to Sima Guang’s *Comprehensive Mirror for Aid in Government* the now lost *Charts of the...*
**Opposing Territories of the Chinese and Non-Chinese (Hua Yi duijing tu 華夷對境圖)** as giving the diameter also as 100 **li**, but the circumference as 240 **li**. The 1890 Shouzhou gazetteer notes, “Past records state that the length of the reservoir was originally 100 **li** and its circumference was some 300 **li**. Currently the circumference is 120 **li**. Furthermore, [within] that 120 **li**, the reservoir is only three tenths; the remainder has all silted and is now fields.”

Today, the surface area of Anfengtang is about 34 **km²**, or 3,400 hectares.

In a map illustrating the historical evolution of Quebei from Spring and Autumn times to the present (see Fig. 3), Xi Chao shows the reservoir as being at its largest from its putative beginnings up to A.D. 589. Then he shows progressively shrinking dimensions for four subsequent periods (Sui-Yuan, Ming, 1949, and present [i.e., 1962]). The map depicts the original reservoir as shaped like a Salvador Dali-esque “melting heart” circumscribed by a line extending from the middle of Wafuhu lake near Jia Miao 賈廟 in the east, southwestward to modern Anfeng 安豐 on the north central shore, thence northwestward to where the Pi River is joined by the outlet from Chengdong lake 城東湖, then southward to form a rounded bottom just past modern Zhongxingji 種興集 village, and then east by northeast to return to the starting point, which gives an estimated circumference of roughly 125 km, or 300 Han **li**.

While Xi Chao’s melting heart has been taken as the characteristic configuration of the pre-Tang reservoir, he does not explain how he arrived at it. Yang Shoujing’s supplementary atlas to his study of the *Shuijing zhu* shows a more ovoid and smaller body of water, but that perhaps reflects the assumed shape at the beginning of the sixth century. Nonetheless, Xi’s unique shape appears in the historical maps of the area prepared under the direction of the noted historical geographer Tan

---

72. *Hua Yi duijing tu*, cited in *Zizhi tongjian* 資治通鑑 (Beijing: Guji chubanshe, 1956), 74.2351.
W.G. Crowell / T'oung Pao 98 (2012) 349-384

Qixiang. Since both scholars were at Fudan University, Tan’s maps perhaps drew from Xi’s work. Curiously, though, Tan’s maps for the Spring and Autumn and the Warring States periods, while marking the spot with the reservoir’s name, do not actually depict Quebei. It is only with the Qin maps that the outlines first appear. For their part, the historical maps edited by Guo Moruo do not show Quebei until the Warring States period. These omissions perhaps reflect uncertainty about the reliability of the attribution to Sunshu Ao.77

An indication of how Xi (or whoever) might have arrived at the size and shape of the Quebei reservoir based on information found in the

---

Hanshu is offered by the compilers of a "Brief History of Huai River Water Conservancy" published in 1990. According to them, although the Hanshu does not give any dimensions, it does state that the Bi 淮 and Ruxi 如谿 rivers fed Quebei. They identify these with today’s Pi 淮 and Xie 泄 rivers and conclude that the western edge of Quebei in the Han reached to the Pi, going so far as to suggest that it might even have extended as far as Chengdong lake in modern Huoqiu county. This would have given a total width of perhaps 40 km, or about 96 Western Han 里. This size, they say, would agree with the 100 里 figure given by several sources, the smaller size cited by Li Daoyuan being the result of the water level dropping because of diversion of water upstream to meet the needs of expanding cultivation.78 Probably of greater importance, however, was silting stemming from deforestation that reduced flow to the reservoir.79 Such problems are specifically mentioned in A.D. 430, when silting in the feeder canal from the Bi River was such that trees and brush had begun to clog it.80 The reduced flow perhaps accounts for Yang Shoujing’s ovoid shaped reservoir, since the southern section would then no longer have been inundated.

Changes in the reservoir’s shape and later descriptions clearly indicate that the southern end was comparatively shallow and that by modern standards the northern end was not particularly deep either. This raises the question: how high and how long were the dikes? In the absence of data that would permit any precise calculation, even an approximate answer to this question is difficult and would be highly speculative. Still, with what we have, it should be possible to venture a general description that offers some appreciation of what was involved. Fundamental to this exercise is an understanding of the topography and geology of the area.

The length and height of the dikes were directly related to the topography and the hydrogeology of the middle reaches of the Huai River, where Quebei is located. The land surface is generally flat, with a gentle south-north gradient from the Dabie Mountains to the Huai River and

---

78 Huaihe shuili jianshi 淮河水利簡史, ed. Shuilibu Huaihe shuili weiyuanhui Huaihe shuili jianshi bianxie zu 水利部淮河水利委員會《淮河水利簡史》編寫組 (Beijing: Shuili dianli chubanshe, 1990), 55-57.
80 Shen Yue 沈約 (441-513), Songshu 宋書 (Beijing: Zhonghua shuju, 1974), 51.1465.
a number of significant depressions nearer the Huai. The soil is loess deposited over the centuries; it probably originated in the mountain ranges to the south, which have been eroded. This erosion contributed to the silting of the reservoir and of the rivers that fed it. The water table is close to the surface, and rainfall is plentiful, with about fifty percent falling during the summer months. The high water table and the abundant precipitation fill the surface depressions so as to form a number of kettle lakes, some quite sizable, south of the middle reaches of the Huai. It was such a depression that provided the basis for Quebei.

I suggested earlier that the Quebei reservoir was developed from a wetland or a kettle lake formed by water collecting in a depression. This lake was expanded and its capacity increased by constructing dikes along the banks at the lower end and then directing water from the Bi River and other sources into the basin. For the premodern era there is no record of the length of the dikes at Quebei, though one possible indication is the placement of the head gates, since these would have been incorporated into the dike structure. When Li Daoyuan wrote, there were five gates. One was at the southern end and controlled the inflow; it does not concern us here. Of the remaining four, two were in the middle of the northern dike and fed Quebei Canal and Sheep’s Head Stream (see Fig. 2). One in the northwest corner emptied into Xiangmen reservoir 相門陂, while Jing Gate 井門 at the northeast corner emptied into the Fei River. From these two gates, the dike must have extended some distance southward on either side. The dike thus would have been nearly two-thirds the perimeter of the reservoir, or around 80 里. Over time, as the reservoir bottom collected silt, the dikes would have been raised and extended to maintain capacity, which in part may explain the greater

81) Shouxian zhi (1996), 74-75; Zhang, “Huaihe zhongyou Jiang Huai huqun xingcheng de dili yinsu he shehui yinsu,” 54-55.
82) Shouxian zhi (1996), 78; Zhang, “Huaihe zhongyou Jiang Huai huqun xingcheng de dili yinsu he shehui yinsu,” 54-55. Average annual rainfall 1955-81 was 906.7 mm, which is comparable to Amsterdam.
83) Zhang, “Huaihe zhongyou Jiang Huai huqun xingcheng de dili yinsu he shehui yinsu,” 54-55. These lakes include Chengxi hu 城西湖, Chengdong hu 城東湖, Wafu hu 瓦埠湖, and Gaotang hu 高塘湖. Zhang also includes Anfengtang in this group, although the depression that originally produced Quebei no longer exists.
84) Shouxian shuili zhi, 72, says that the Xiangmen and Jing gates would have also functioned as flood discharge gates when the reservoir overflowed.
dimensions recorded for the Song. Finally, according to the *Anfengtang Gazetteer*, during the Yuan (1271-1368) the dike was extended around the southern end, completely encircling the reservoir. Gradual extension of the dikes led to the construction of additional gates. Thus, during the Sui, the number was increased from five to thirty-six.

Besides giving some indication of the length of the dike, the head gates may also offer insight into its possible height. As with length, height at any given period would have been dependent on the attention and resources devoted to the dike’s maintenance. Textual sources say nothing about height, but considering the soil locally available for constructing the dikes and the level of construction technique, they were probably comparatively low and the reservoir, relatively shallow. The soil used in the construction would have been easily eroded and required constant repair. In the mid-fifth century, just a few decades before Li Daoyuan wrote about Quebei, the dikes had reportedly fallen into such disrepair that there were serious water shortages in summer and in the fall.

In contrast to the dikes, the head gates should have been well constructed, since they had to withstand the force of the water that was released through them. Moreover, as openings through the dike, the gates were particularly vulnerable and needed to be strong enough to resist the water’s natural tendency to enlarge them. This assumption is borne out by the remains of a Han dynasty gate-dam (*zhaba*) excavated at the site of the Anfengtang spillway in 1959. The gate-dam was built in an excavated channel, the bottom of which had been covered with broken rock or gravel: this provided the foundation atop which the dam was constructed of alternating layers of soil and grain stalks. A neat row of wooden piles was driven down through the gravel into virgin soil. The loose straw was laid in the direction of the water flow,

---

85) The gazetteer does not offer a source for this statement. See *Anfengtang zhi*, 41; *Shouxian shuili zhi*, 68. In 1935, the dike’s length was determined to be 25,889 km; in 1958, following reconstruction of the dike and the addition of a new dike on the southern end, the total length was 25 km.
87) See note 28 above. An indication of the low level of construction technique is the frequent failure of dikes during the Western Jin. See n. 67. For comparison, various measurements of the dikes taken from 1931 to 1976 put the depth at approximately 27-30 meters (*Anfengtang zhi*, 42-43). It seems unlikely the ancient reservoir would have reached such depth.
88) *Songshu*, 51.1465.
and the thicknesses of the separate layers were similar. The earth layers were of a clay that seemed to have been sifted; it contained little sand, was gray in color, and was very cohesive. Because the clay was so fine and free of small rocks or vegetable matter, it would have been unnecessary to tamp it in the manner used to strengthen earthen walls.\(^8\) At the bottom of the gate-dam was a pool formed by a weir across the channel constructed of alternating layers of diagonally laid logs. The archaeological report speculates that when the water level fell below the crest of the gate-dam, the grain stalks would have allowed water to seep through and fill the pool for distribution to nearby fields. When water was plentiful, the pool would facilitate distribution for irrigation as well as redirection of excess flow. The Anhui archeological work team considered this gate-dam to be a forerunner of the use of fascines in dike construction, a technique that previously had been thought to have originated during the Song dynasty.\(^9\) Unfortunately, the archeological reports con-

\(^8\) The gray color indicates that the clay contained organic matter and had been under water. Together with the clay’s fine consistency and cohesive character, this suggests it may have been mud taken from the bottom of the reservoir. Once the mud used to form the gate-dam layers became desiccated, it could have formed a solid and impermeable barrier to support the gate-dam. I am grateful to Tom Szymoniak for his insights on this point.

tain no measurements, diagrams or photos of the gate-dam; this renders somewhat speculative the reconstruction of it proposed in Fig. 4, which is based on the sketchy description of the reports.

The construction technique used for the Quebei gate-dam is still in use in China for small coffer dams (that is, temporary dams to divert water, usually for construction purposes). Comparison with the modern applications can perhaps offer a clue to a possible height for the Quebei dikes where the reservoir was probably deepest. In modern use with improved construction techniques, such dams are considered suitable for depths not exceeding 6-8 meters and where the flow is less than 3.5 m/sec. (This of course refers to use in streams, as opposed to a reservoir.) This suggests that the Quebei dike probably did not much exceed five meters at the northern end; it would have been much shallower at the southern end. In current applications, such dams tend to slough off soil and the grass is prone to decay, so they are not usually considered good for more than two years. However, the attention given to the materials used in the Quebei gate-dam, to construction technique (e.g., the use of pilings), and the need for a sturdy structure, must have resulted in greater durability.

Conclusion

A proper understanding of the history and development of Quebei can be a valuable contribution to our knowledge of the development of Chinese agriculture in general and irrigation in particular. Heretofore, that understanding has been hindered by the unquestioned and appealing attribution of Quebei to the early sixth-century B.C. Chu statesman Sunshu Ao. When that view was finally challenged, the ensuing and rather unproductive debate centered on the question of why (or why not) Sunshu Ao should be accorded credit for Quebei, and if not he, then who? Largely overlooked was the matter of the history of Quebei itself, independently of whoever might have built it. Examination of the

historical context—including the political environment and the evolution of reservoir irrigation technology—together with a careful evaluation of the textual evidence points to the conclusion that as an irrigation reservoir of substantial size, Quebei dates from much later, most probably from the latter half of the Western Han. Prior to that time, it was no more than one of the many depressions found in the Huainan region that collected water to form ponds, kettle lakes, or marshes and wetlands. Spurred by a fad for water projects under Emperor Wu of the Han, local officials took advantage of the topography and of the water available from nearby rivers to enlarge Quebei’s capacity by constructing dikes around the northern end of the depression. By the early Eastern Han the reservoir was well enough established that Wang Jing 王景 could utilize it to increase the arable land in Lujiang commandery. Thereafter Quebei remained a significant element in the economic, political and social histories of not just the region, but of the empire.

Correctly dating the reservoir’s origins has significance beyond properly understanding Quebei’s history and the history of the area. It lends further support to the growing realization that the Han—the Western Han in particular—was an important transitional period in the development of irrigation. The development of the great river-fed irrigation systems of the Warring States, Qin, and early Han was increasingly supplemented or replaced by stored-water systems that could stabilize supply for irrigation needs. That Han and post-Han times were a developmental period in this type of irrigation is evidenced first by the problems encountered in constructing and maintaining reservoirs. The latter seem to have been prone to leak and to burst their dikes, suggesting that the proper construction techniques had not yet been developed. Quebei’s economic importance and its strategic position between north and south China ensured—the political situation permitting—that it would be well maintained. The transitional nature of this period is also suggested by the excavated Han gate-dam at Anfengtang. The manner in which soil and straw were employed to strengthen the dike where the head gate was set and to not only control water flow but also allow it

---

92. HHS, 76.2466, and n. 8 above.
through when the water level dropped below the gate crest demonstrate a growing sophistication. At the same time, the loose placement of the straw, rather than its being bundled into fascines, plus the apparent absence of such features as a toe berm to stabilize the gate dam and prevent seepage, point to an early stage in the development of the technology.

But the story of Quebei does more than inform us about the evolution of China’s agricultural technology. It also offers a cautionary example of the perils of studying local history. So attractive was the notion that the eminent statesman Sunshu Ao was the originator of the reservoir that until recent times no one thought to question it. Indeed, not only did the tradition gain wide acceptance; texts and events were interpreted in a manner that corroborated it.94 The tradition remains an important element in the local identity of Shouxian. Similar traditions can of course be found almost anywhere people feel pride in their locality. Still, the example of Quebei reminds the historian of the need to remain sceptical and to question accepted truths, while demonstrating the rewards of doing so.