

Environment in Asia Series featuring Brian Lander – The Ecology of China's Early Political Systems, February 7, 2022

- All right, so.

- [Mark] Hello, everyone, and welcome to today's talk. We'll get started momentarily after we give another minute or so to have people have a chance to log on at the last minute. We thank you very much for joining us.

- So Brian, I'm gonna keep eye on the attendees, look at the number, and then let's wait for maybe two, three more minutes to start.

- I like it. Wait for the laggards .

- Yeah, that's true. I see the names of many of our common friends from all over the world, literally.

- Nice. There's a participant called Clean Air.

- Welcome, Clean Air. All right, I can tell we have more than 60 participants, attendees already. Brian, I think probably we should just start, let the rest to come in by themselves slowly. All right, here we are. Welcome, everybody. Everybody we can see, friends or new friends, colleagues we've never met and from all over the world, welcome to this event for the Environment in Asia research series. My name is Ling Zhang, Zhang Ling in the Chinese way. I am an environmental and economic historian for counseling China. I teach at Boston College and for the Fairbank Center for Chinese Studies. I am acting as a convener for the research series Environment in Asia, so welcome all of you to join us. So today we will have our first event for this new semester. So one thing I wanted to quickly mention, currently I am in Hangzhou, China, so I'm really concerned about the WiFi since I'm calling all the way from the other side of the world. So in case things, the WiFi quality goes down and if I drop offline, and you will not see me again in the middle of the wonderful talk, so Brian and our colleague at the Fairbank Center, they will carry on the event, so you can carry on without me, but I hope that such a thing will not happen. I don't want to miss the talk. So without further ado, let me introduce today's event and our wonderful speaker, Brian Lander. So, first of all, Brian actually is right now not in United States either. So he is in Paris, France. So two of us together with our colleague Mark Grady, who organized this event in Boston, so we are literally hosting a global event for all of you, so what a wonderful occasion. So all of us want to wish you, especially those of you who celebrate Spring New Year, so we wish you Happy New Year, and we are so happy to see you at the opening of the Year of the Tiger. So Brian here is gonna talk to us about his recently published book from Yale University Press. So the book is called "The King's Harvest: A Political Ecology of China from the First Farmers to the First

Emperor." Very interesting book, which I had the privilege to read, actually early draft and then the final printed version. Really wonderful work, and I learned a great deal. So Brian is an environmental historian and also a scholar of archeology for early China. So he currently teaches at Boston, sorry, Brown University for the history department, and he's also associated with the Brown's Institute, the Research Institute for Environment. So Brian is currently on research leave, but it's such a wonderful opportunity for him to call in from Paris to speak about his new book. So today's event, we will have roughly about 85 minutes from now on. So Brian will speak about 35, 40 minutes, right? And depends on how time goes. I wish I could use my convener's privilege to ask a couple of questions if I don't lose my WiFi access, and then we will open up for the Q&A section for the attendees, or all of you dial in and call in to participate in this event. You cannot see the questions posted to the Zoom's Q&A section, so we will work as your discussant, as your convener to read out your questions. So I encourage you to spend a little bit of time to type out your thoughts, your comments, your questions by using the Q&A function of the Zoom platform. So I will read the question out loud to all of the participants, then Brian will respond, let's hope, to all of them. So here is our plan. So without further ado, let me turn to Brian. Welcome, Brian.

- Right, thanks a lot for the great introduction. It's nice to be here in this, what? What's the word? I don't know, in this global event that isn't happening in any particular place. So today I'm gonna talk about my research. I'm going to actually go straight to my screen. Let's see. Whoops. All right, are we good? Can you see that? All right, okay. So today I'm gonna talk about the ecology of China's early political systems, and particularly the case of Qin. So my book essentially begins with the beginning of agriculture and goes all the way until the fall of the Qin empire. So my talk today will really focus on sort of the last section of the book and Qin in particular. Let's see. Okay, so the focus of my research is essentially the central Yellow River Valley, which is the Guanzhong Basin of Shaanxi, and then the Yellow River Valley to the east towards Henan. And in particular, this includes the Shiyan area, which was the home to the Xi'an and Chang'an, the two imperial capitals of that region. and then Luoyang, the other imperial capital. So this is really the main center of imperial power for a lot of ancient Chinese history. And the question is, how did the formation of political systems impact the environment? And in fact, I should say, we're gonna talk about this more later, that I initially started out wanting to know how those environments changed over time, and the political aspect of the story came through the sources. It wasn't the question I set out to explore. Okay. So I'm not gonna talk very much about these sort of wider ecology part of the story, but if I can use this slide as a way to introduce the big picture. I did a lot of research on the wild plants and animals of the Guanzhong Basin. I published this article on early China a year or two ago if anyone wants the details, and also another

article with Kate Brunson. And essentially if you had gone back to the Xi'an area 5 or 6,000 years ago, you could have run into any and all of these animals: rhinoceros, wild horses, wild water buffalo, seven kinds of deer, tigers, leopards, two kinds of bears, and so on. And this is just the larger animals. It was also a huge amount of other biodiversity. Now if you go to Xi'an now, how many of these animals can you find? Or even the sort of rural areas of the Guanzhong. Whoops, going in the wrong direction again. I just got a new keyboard. So these are what's left. Essentially the only thing, the only wild animals, the only wild mammals you can find in the densely populated Guanzhong Valley are some bats, which tend to live in human houses, and hares, which eat human crops. And so that's the big picture. There used to be a whole enormous amount of biodiversity and now there is not. Why not? And so the question is to think about the different elements of human history over a very long time period that led to the gradual disappearance of almost all of the wild plants and animals of this region. So the concept I'm gonna use today is political ecology, and this is not the field of that name in geography and development studies. Basically I just combined the dictionary definitions of politics and the dictionary definition of ecology and came up with the study of how the form, organization, and administration of states affect the distribution and abundance of organisms. And so in the big picture, especially agrarian states, tend to increase the availability of agricultural organisms, a very small number of them, and decrease the distribution and abundance of most other types of species. And we can expand this to think about even modern states. Essentially the argument is that states promote the expansion of ecosystems and economies, which in some ways are the same thing, that produce taxable resources. This is true of all states throughout human history. States essentially get their resources from a limited number of, a limited sphere of ecology, and they want that to get bigger, and they want everything that they can't tax to, well, they don't necessarily want it to disappear, but they certainly don't mind if it does. Okay, so now I'm gonna turn to early China and, in particular, the region that I'm studying. So if we look at the history of political organization in the central Yellow River Valley, go back to the Neolithic Period, let's say 6, 7,000 years ago, you have egalitarian settlements with little political organization. There is essentially no kings. There's no people who are in charge of everybody else and tell them what to do in a very large scale. If you move on to the Western Zhou a few thousand years later, you have a hierarchical alliance of polities with a weak central government. So you have Kings, you have armies, you have the ability of political groups to mobilize resources and mobilize people, but you do not have an emperor, a person who is in charge of millions and millions of people. When we get to the Eastern Zhou, both of these came at the same time, you have frequent warfare between states that leads to state strengthening innovations. My book has a chapter about that, essentially how states build up their capacity to extract more and more resources from the areas they control and more and more resources, more and more labor from their

populations until you come to the Qin empire, which is the last of the Eastern Zhou states to survive, in which you have a centralized, bureaucratic state with direct control over people and land. And so my book essentially goes through this process of how you went from having a society with no kings and no rulers, unruled, to this highly powerful centralized imperial system. Now one of the key figures that I talk about is Shang Yang, who was the minister, the chancellor of the state of Qin. And he essentially is a key figure, both because he was one of the architects of the Qin imperial system, and also because he is a person whose history is very well told by Sima Qian and others. In some ways, the story that we have of him is actually a composite of longer-term processes, sorry. Because he came from states further east that had developed these things over time, and then he sort of brought them all together in Qin. And so his system was characterized by agricultural fundamentalism, essentially the belief that only agriculture is actually productive and everything else is more or less parasitic, a system of ranks or orders of merit in which you actually reward men based on how well they do in the military, essentially trying to recreate society so that serving in the military and paying your taxes is actually a way to get ahead in society, so people want to do it, and then a system of land redistribution to reward people for their ranks. So the more higher rank you get, the more land you get. And Shang Yang is, of course, also famous for emphasizing written laws, and essentially along with some other theorists of political systems, a lot of emphasis on writing and systematization, and this is useful for historians because the Qin state ends up producing a whole lot of documents. Okay, so Qin reached the height of its power during the reign of King Zheng, who declared himself the First Emperor in 221. And then after he died in 210, the empire essentially fell apart. And so what I'm gonna do today is analyze, just give an overview of the ecology of how the Qin empire worked as an ecological system during that exact period. We happen to have quite a lot of documents that were excavated from this period, so we now have the ability to understand how the system worked, whereas even a generation ago or two, we really just had a very vague idea of what Qin was like as a system. So in terms of sources, we have archeological evidence. The most famous piece of archeological evidence related to Qin is obviously the Terracotta Army, but we also, of course, have things like animal bones and even beautiful bronze animals from the same tomb. We also have the received texts that have been passed down since the time of, well, since the Han 2,000 years ago. So this is an image of Sima Qian's *Shiji*, the historical records, which is a key text. And then we also have excavated documents. And so excavated documents, in particular, we have a large numbers of documents that are actually written by local officials, and unlike these official texts, they're essentially unedited. They're the everyday bureaucratic paperwork that give us a really good idea of what was actually going on, on the ground, usually in sort of very distant places. The good preservation conditions in the Qin empire were, in particular, in Hubei and Hunan of South China. That was not

at all an important part of the empire, so we have an interesting slice of bureaucratic information. Together, all of these things tell us quite a bit. So this is the approximate area of state control at the height of the Qin empire. And if you look at, oh, yeah, red dots indicate Commanderies, which are the highest administrative units. They're essentially military administrative units under Qin. Under Han, they became more a part of the standard administrative system, more like provinces. And if you look at this map, this is a map that comes, well, I think I modified it a little bit, but it mostly was made by somebody on Wikipedia. I think that this map is actually much better than the maps that are printed in most English language and Chinese language history books because most standard history books present all of South China as being part of the Qin empire, but Qin, of course, had just conquered these regions and essentially the head of network of roots that it could move its armies along. It controlled key areas such as the Guangzhou area, in particular Hunan, but actually apart from what's now Hunan, Jiangxi, and Zhejiang, and maybe the Shanghai area, Qin actually didn't have very much power south of the Yangtze River, but it did control some of the key agricultural areas, and that gets to my next point. If you look at these, the distribution of Commanderies, and you compare it with the distribution of agricultural land in East Asia or in mainland East Asia, you can see that the best farmland in East Asia is the North China Plain and the East China Plain, all the way down to Jiujiang, and then you also have the Sichuan Basin, and then you have the area of Hubei-Hunan, which was much less developed at the time. Now if we look at them, if we compare this map with the map of the Qin empire, we find that they matched pretty well. Essentially the Qin empire was really focused on the most productive agricultural areas in the continent, and they didn't bother extending their administrative control into mountainous regions because those regions did not produce enough resources to actually repay the cost of controlling them. They certainly would've attacked them if there had been any rivals in them, but there weren't by this point because they'd conquered them all. Okay, so I'm gonna go over six aspects of Qin political ecology. Have we got a question? Oh, got a Pokemon question. I'll leave that for later. Can you still see my slides? Okay. Sorry, trying to close the, okay. So we're gonna start with information and then talk about farmland, then grain areas, then human labor, then animals, and then non-agricultural resources. Sorry, I'm just fixing my screen. So information was pretty key to the whole system because they didn't have particularly good roads at the time, and there wasn't a well-developed system of canals like there would be later. And so the ability to move the key resources of the political economy, which was a particular grain, was quite limited. And so the state essentially functioned by controlling how surplus resources and labor were used at the local level all the way across the empire. Unlike modern political systems, they couldn't concentrate wealth at the capital and then redistribute it. They actually had to leave it where it was and be the ones who decided how it was used, and so there was a huge amount of writing on wood and bamboo being sent

across the empire. So here is one of the laws from excavated Shuihudi, and it says, "When rains are timely and the grain ripens, immediately report in writing the crops, grain in ear, and the area of cultivated and uncultivated fields. Immediately report the area of land affected by drought, violent wind, or rain, floods, or hoards of pests that injure the grain." And so the what's interesting about this is that in many periods of later Chinese history, empires essentially just set a fixed tax rate on a piece of land and you pay the same thing every year, whereas Qin had a much more intense... Because Qin's political system was developed in the Guanzhong Basin, which is quite small, they had a very intensive form of governance, and they tried to keep this form of governance going even as they spread all the way across the subcontinent. This arguably is one reason why the Qin empire collapsed, is because this was too energy intensive of a way to run a large empire. But in any case, the point is that local officials had to tell the central government how crops were doing all across the empire so that officials in the capital could make decisions about how much grain was gonna be available all over the place. This is from the early Han laws from Zhangjiashan, but I think that this is probably a Qin law, like most of the early Han laws. So every year local officials sent the following registers up to the county court. They had to send records of people's houses, yards, and household members, their ages, their land and neighboring fields, unified field registers, and field taxes, which means that the state was keeping very close tabs over the two things that were most important to its power, namely land, productive farmland, and human labor. Another interesting thing we have from Liye, which is a well from western Hunan, we actually have a list of all the things that local officials made lists of. And so that's what these registers are. They're essentially just lists of what is in the local county government. So they kept lists of grain crops, of loans, of livestock, of equipment, of cash, of laborers, of cattle, horses, sheep, goats, and, of course, of the Office of Fields. And so the county government, or this is kind of a garrison, but they're essentially keeping track of all the things that they could keep track of, probably so that officials, if they needed to, could sort of audit what was going on. This was to make it difficult for local officials to steal and so on. But this tells us that the state, well, first of all, gives us a list of the things that the state considered important, was keeping track of, and it also gives us some idea of how carefully they were monitoring what was going on in their offices across the empire. Okay, let's talk about farmland. So as I talked about earlier, Qin had a system which seems imaginary, but apparently actually worked, where every single adult male would have a rank. So there was a standard rank that you had if you didn't win any ranks, but if you did well in war and cut off a lot of people's heads, you would be awarded a higher area of rank or a higher level of rank, and with that came a whole bunch of benefits, including, for example, reduced sentencing if you got in trouble. If you killed somebody or something, you would maybe not get your eyes poked out or your fingers cut off or something, but you would also get

more land. And the way they did this is that they divided the landscape into strips, and each strip was one mou. Well, it was essentially every strip was one mou, and a mou was a standard, it's kind of like an acre. It's a standard measure of land. And because they were strips, it was very easy to redistribute them according to if you got more, if you got less. So this image that I'm showing is actually a Google Earth image of the landscape just west of Xianyang, the Qin capital. And if you look at the measure here, this line, can you guys see my arrow? Yup, okay, so this line is essentially the exact measure of a Qin mou. Well, it's a mou would've been that long, so what this means is that this landscape was laid out in these lines, either in the Qin or in the early Han period. And, of course, if you look around the landscape of North China, you can find all kinds of different widths of measures, so it isn't like the whole landscape is still just as it was by Qin and Han. But if you search around on Google Earth, you can actually find a fair number of places where the measures are actually of around this width, and that means that those areas are almost certainly remainders of the official field layout system of the Qin and Han, which was, again, created to reorganize society, to incentivize people to want to fight in the army, and, of course, to pay their taxes because the government knew exactly how much land they had. The next big part of the Qin political economy was granaries. This is a granary model, a model of a granary that was discovered in a Qin tomb, and this was quite common in Qin and early Han, was to put models of granaries in your tomb, presumably because a granary is something you wanted in the afterlife. But the point for the Qin political economy is, as I said earlier, Qin could not move grain all over the place. Essentially farmers' taxes were all stored in granaries in their local districts or their local county office. And then during the winter, when people had to do their labor service, they went back to the granary and the government issued them a certain amount of grain that they could then eat. And most of the grain at this time was millet, and so people were eating millet, which they sort of boiled up in gruel or in kind of like dry rice and ate it like that. So the state essentially took their surplus grain in the form of taxes it harvest on and then gave it back to them in the winter time when they did labor, which was required as part of their sort of like labor tax corvee. You can think of it as them eating the grain that they themselves grew in a sense while they labored for the state. And so there's a lot of statutes on granary. This one is one I like 'cause it's funny. So it says, "It is the practice of the court that for three or more rat holes, the responsible official is fined. Three mouse holes are equivalent to one rat hole." So they had very precise measurement of the holes of the rodents that were getting into these granaries and punishing people, officials, for allowing those rodents to get in. And this gets to the bigger issue, which I discussed in earlier parts of my book, of the human, the sort of the larger ecology of agricultural societies, which involves all kinds of animals that humans didn't really want there, plus the few that they actually did. And so mice and rats are a big part of human societies at this time as

our dogs and so on. There's also regulations on feeding convict laborers. So this is from the statues on granaries at Shuihudi. So, "A male bond servant..." A bond servant is a type of hard labor service. So, "A male bond servant receives two bushels of grain per month, a bond woman, 1 1/2 bushel. No rations are given to those not engaged in work. Non-adult wall builders," which is another status of prisoner, "and bond servants who are working get 1 1/2 half bushel of grain per month." So essentially there were a lot of convicts. All kinds of different punishments, all kinds of different crimes were punished with a sentence of labor. Some of the sentences were rather light, and you could sort of serve them on and off, and some of them were very heavy, in a sense. The state was gonna probably work you to death unless you were really tough and could survive. The other thing that happened more and more in Qin is that the mutilating punishments, like cutting off hands and feet, were, what's the word? I can't remember the word. Anyway, they decided that it wasn't actually very practical to cut off people's hands and feet because then they were not so useful for the rest of their life, and so instead they would get them to pay heavy fines, and the fines were paid, you were paid to work for the government, but the amount you were paid was so low that it meant that you would be working for the government for a very long time. So between those two different types of servile labor, the government had a lot of labor at its disposal in addition to the corvee laborers. And so this gets to the issue of human labor. This is an image from the Qin of a canal being dug. So it's just an idea of makes you think that by the time of the 18th century when this was made, China already had 2,000 years of experience organizing large numbers of people to modify the environment. And this one is interesting because you actually, the description talks about how they're divided into teams and the teams worked for prizes of liquor and dried meat and stuff like that. And so there there's a whole managerial expertise that's been built up that would've already been in place under Qin and Han. So the Qin empire had huge amounts of labor at its disposal. It had millions of subjects, and those people had to do, they had to do work for the government, and then they had convicts who could, you could send the convicts to places where normal taxpayers wouldn't wanna go, and so on. And this, if you read Sima Qian's description and Jia Yi's descriptions of Qin and what was wrong with Qin, a lot of the focus at the time was essentially that it was abusing people's labor, had so much labor that it was just getting people to do all kinds of useless projects. And if you send all the, if you send the healthiest members of the family to go work for the government, you're leaving the weaker members to do all the actual productive work. The actual foundational labor that society is based on is being done by people other than them, and if you are that, usually men, you would be very bitter about knowing that your family are toiling back home while you're doing something totally useless, like building the emperor's tomb. So this explains why the state tried so hard to keep track of individuals. And if you think about the fact this is 2,200 years ago, it's rather astonishing that this big empire had records of every single, or tried



to keep records of all of its subjects. And so this is just a standard one from Chu. So Jing means Chu, the state in the south which had its own rank system that was still being employed. So the man's name is Manqiang. His wife is called Qian. He has a son of this rank, different rank, lower rank than his father, a daughter, and then a slave. And household slaves were not uncommon at this time, but as far as we know, slavery was not employed as it was on the other end of Eurasia and the Mediterranean at this time for large scale agricultural production. So slavery was not, convict labor was exploited on a massive scale, but officially slave labor was not. So if we think about what the state used all of this labor for, a lot of it were routine statute labor tasks. So for example, the statute on agriculture that was excavated in Sichuan, and, in fact, was later copied into Han law and reads, "In the ninth month, do a great clearing of roads and dangerous sloping passages. In the 10th month, build bridges, repair dikes and dams, and ensure the smooth flow of water at fords and bridges." And so basically local government officials are going around their landscape and trying to make it more efficient, more productive. The water infrastructure is really important for irrigation, for producing crops, for preventing floods, and, of course, things like bridges and roads are essentially opening up the landscape for the movement of goods and the movement of soldiers and creating a more efficient humanized landscape. And so if you think about this on this scale, this being done every year, this is right after harvest time for many people, this is really the empire from the center imposing its vision of sort of good infrastructure across the subcontinent. And this is a map from the early 20th century of the famous Dujiangyan work in Sichuan. And so what that did was built an irrigation system up at the top here, on the top left, and then redistribute water all the way across the Chengdu Plain. And this is a classic colonial project because Qin conquered this region from the state of Shu and essentially destroyed the indigenous political system, brought in a bunch of colonists, reorganized the landscape, and essentially created this huge, really productive agricultural area that they then used to build an army to conquer the state of Chu downstream in the middle of Yangtze region. Now the archeologists, some of them from Harvard have done a survey of this region and found that some of this system may actually have been in place before Qin conquered, and, in fact, we know very little about the state of Chu, but, in any case, Qin conquered this region, colonized it, and continued to reorganize the landscape to make it more productive. There was another project, the Zhengguo Canal, which I discuss in the book, in the Qin capital region of Shaanxi, but more of the irrigation systems would've been smaller scale, the type of thing that local government officials dealt with and things that we actually know very little about because they were so small scale and local that they're not mentioned in our sources. Another famous mega project was the Long Wall. And so Sima Qian says, "In my travels I saw the Long Wall and fortifications that Meng Tian built for Qin cutting through mountains and filling up valleys to open up the Straight Road. The First Emperor

indeed treated the people's labor lightly." And so this is essentially the stereotype of Qin as the Qin was just so abusive. It used people's labor so intensely, and scholars such as Derk Bodde in the West have pushed back against this, but my opinion is that it's probably more or less correct. And it's also just hard to explain how an empire as successful as Qin in taking over such a large enemy area and defeating all of its enemies was just destroyed so quickly by uprisings, and clearly the explanation that people were fed up of being treated like livestock is actually a fairly convincing one. This is an image of what is officially the Qin Great Wall in Guyuan in Ningxia, but I've been told that this might actually be a Ming wall, so I don't really know. Of course, the most famous of all of the mega projects is the First Emperor's tomb. It's so big that it looks like a hill, and the Terracotta Army, which you all know of, is just one part of the complex. Gideon Shelach has estimated that this may be the largest tomb ever built for any single human being in human history, and this probably is based on the fact that the Great Pyramids are built for more than one person. But nonetheless, this is an absolutely massive project, all built within essentially the lifetime of the great emperor while all of these other things, the Great Wall and everything else, were being built. And so really people were, and Sima Qian says that hundreds of thousands of families were moved to this area to build this tomb, so really huge amounts of human labor being used to build these projects. So in addition to human labor, we also have animal labor. It's interesting if you think about all of the many types of life that are living in an average Chinese village at this time. Well, I won't go through it, you can read Chapter 2 of the book, but there are very few that the state seem to manage to tax. In particular, every village had pigs and chickens and dogs, and you don't see anything about those animals in the documents. Essentially, the government didn't find a way to get people to pay taxes on them, so they were tax free. The animals that were taxed in particular were horses, well, not taxed, but the state was very concerned about horses and cattle, and probably also the herds of sheep and goats in Northern China, but because we don't have any texts, we don't have any local texts from like Northern Shaanxi, Northern Shaanxi, Hubei, and so on, so we don't actually know what was going on. But Sima Qian discusses the herds of those regions as being one of the great wealth of the Han empire. But horses were the animal that the empire was the most concerned about, and, in fact, horses, of course, are something that many Eurasian empires were totally obsessed with because horses were the tanks of the ancient world. I mean, if anyone who's ever been at a demonstration or something and seeing police on horseback, you immediately feel how much somebody on a horse is more powerful than you are on the ground, and if you can get huge numbers of horses, then you've really got a lot of power going on. The other thing that happens around the time of the Han empires, that you have the formation of the nomadic empires, while they essentially are formed right as Qin collapses, but you have very powerful nomadic pastoralists in what's now Mongolia and Inner Mongolia. Of course,

they were very good on horses, so there's more and more incentive for states to have horses. In fact, the state of Qin, from the very beginning, was a horse breeding state, so that was one of the reasons why Qin was powerful and was able to defeat its rivals, and so that's why there's so many great horses in the Terracotta Army. Another one were cattle or oxen. So there's a passage in the Zhan Guo Ce that says, "Qin uses oxen for plowing and can transport food by river and provision it crack troops with the harvest from first grade lands." This is interesting because there's been a huge debate in, especially in China, about when ox-drawn plows were invented in China. My theory about this is essentially that the question is not really, when were they invented? The question is, did people have enough oxen to actually pull plows with? I think that many of the core regions of China were so populous that people just didn't have enough land by this period, in particular, the central plains in Hunan. That area was already quite populated at this time, and so there essentially wasn't a whole bunch of land around for grazing, and so there just weren't that many cattle. And so Qin's rivals looked at Qin and said, "Wow, look how many cattle they have. They actually can use oxen for plowing." And there's records from the Qin laws of Qin and lending oxen to farmers." There's also the other type of animal, which is dangerous animals. And there's an interesting legal case from Liye where it says that "six people can be exempted," which means from taxation and labor service, "for catching a tiger." So the government is actually telling people, "Go kill tigers. They're dangerous. They're eating our livestock. They kill people, so get rid of them." And, of course, if you look at the map of wild tigers now, it is they're totally absent from China, and happy Year of the Tiger, by the way. So tigers are gone from China, and there's been a long push to make that happen because tigers are, according to the "Field Guide to the Mammals of China," the only mammal that regularly eats humans. Okay, let's go to state control over non-agricultural resources. So the state function, the key thing was the photosynthetic energy gathered from the sun by millet plants and then gathered in granaries and distributed to people working for the state, to its soldiers, and corvee laborers, and so on. That was essentially the core of the sort of energetics of the Qin empire, but they also needed other things. They needed wood and they needed metal in particular. And so this is a picture of the western Guanzhong, just northwest of Baoji. You can see that the Guanzhong region itself is very arid and never had dense natural forests, whereas as soon as you move into the mountains of the west or to the south of the Guanzhong Basin, and the Qin link mountains in particular, you have very big trees and dense, beautiful forests. And so Qin had another advantage over many of its rivals, which was this enormous access to large areas of trees. Qin was also the innovator of legal protection of resources, as far as we know. "In the second month of spring, do not dare to cut timber in mountain forests or to dam or dike water courses. In summer months, do not dare to burn weeds for ashes or to collect indigo, young animals, eggs, or fledglings. One should not poison fish or turtles or arrange pitfalls

and nets. These prohibitions end in the seventh month." You could argue this is one of the world's earliest environmental protection laws. You could also argue this is the government taking control over resources that had previously not been under state control, which was a big part of state strengthening in the warring states period, as I talk about in the book. So you can look at these types of laws in both of those ways. You can look at them as state power, but also as using state power to increase resource sustainability. Of course, whether this was actually effective is a different question. I highly doubt the state was able to monitor wildlife, like hunting, fishing, and logging for more than sort of core areas of the empire. Okay, so that's one element of it. In terms of forestry, one of the most amazing pieces of evidence we have are these maps that were excavated from Fangmatan and Gansu, and they, well, they look like this. So they're pieces of wood that essentially the squiggly lines are rivers, so most of the area of the map is just rivers with names written on them, but there's a bunch of things written about pine and other types of wood. There are some wood names that we can't identify. In fact, some of these, yeah, essentially there's been, the group at Wuhan University has done infrared photography on these so we now know more about what they say than we did before, but we also know that we don't know what a lot of the words mean. In any case, it's a map from the far west of the Qin empire, the upper Wei River Valley. It's near my Maijishan, where the famous Buddhist caves, for anyone who knows where that is. So this was excavated at a modern logging camp in the 1980s, which shows that people have been logging this region for over 2,000 years, and it shows that Qin officials were making maps of this area and keeping track of where the timber was. Oh, before I go onto my conclusion, the other thing that Qin paid a lot of attention to were metals. Qin was essentially around the time that iron was starting to become very common, so iron was certainly around, but bronze was still in widespread production, and it was one of the main metals in use, so this was sort of a transition period in metal. And so the Qin empire kept careful track of copper, tin, lead and iron production, and actually had very large productions of this. They also produced a whole bunch of other types of handicrafts, like ceramics, which also have their own environmental effects. The main environmental effects of producing metals is, in fact, all of the wood that you burn to produce them. And so a lot of these metal production sites were based out in forested areas where they could cut down forests as much as they wanted to. This gets to the issue also that firewood was the main use of wood, so people in their houses were burning a whole bunch of wood as well, so wood was producing a lot of energy in addition to this sort of energy people ingested in the form of food. So if I can just summarize my argument, the state facilitated the expansion of farmland. So the Qin empire had conquered a whole bunch of, it conquered much of the subcontinent. In particular, it conquered all of the really good agricultural land, and all of those places, it encouraged the spread of agriculture, the building of more irrigation systems, water control systems, roads so that people can get in there

and can bring resources out. It used the surplus grain and labor of its subjects to build infrastructure that facilitated the movement of people and resources and reorganized hydrology. And so you have expansion of farmland and then infrastructure being built to make it easier or people to exploit the environment in ways that can be taxed. The state also mapped out and exploited natural resources and also tried to protect them from over-exploitation, so you do have both aspects of state control over environments. And perhaps most importantly, Qin established the model for 2,200 years of subsequent states and empires to follow with enormous environmental consequences. So this model of having a fairly centralized government and a sort of hierarchical administrative system divided into larger units than smaller units in each with chains of command essentially, all the way from top to bottom, which to modern people seems like a pretty obvious thing, but if you looked at the world 2,000 years ago, even later than Qin, you look, for example, at the Roman Empire for much of its existence, it really didn't have that. The Roman Empire was very decentralized. There was no massive bureaucracy at all until the third century CE. So essentially this was highly unusual for its period, and it set a model that people have followed ever since. In particular, I think this is my theory, I haven't found anyone who's written about it, but I think that the existence of books like the Shiji and Hanshu, these ancient Chinese texts that really have a huge amount of information on how administration actually worked in the early empires, was one of the reasons why people were able to keep recreating a similar model, is 'cause they knew what it looked like. The reason I emphasize this is because traditionally people have said, "Oh, China has been the same for 2,000 years," and what I'm essentially saying is that the Qin and Han model was written down, and people kept going back to it and saying, "Yeah, that's actually what we want. That's what we want." Rulers would hire the literati to help them recreate this system over and over, and it's a very effective system for transforming the environment, getting rid of natural ecosystems that are not productive, and replacing them with things that are taxable. This is one of the reasons why China and East Asia more generally has some of the most severe human impact on Earth. And just to bring it more modern... Oh, so this is my book. It came out two months ago. What I've just talked about was essentially the last chapter or second to last chapter, and the previous, if you have any questions about the earlier part, I'd be happy to answer them in the Q&A. Maybe I'll just leave it there.

- Wonderful, thank you so much, Brian, for introducing only the last part of your book. And actually I am gonna use my privilege as the organizer to encourage you to talk a little bit about the previous part, the earlier parts of the book, for one particular issue. In your talk, you introduce a lot of written textual sources, traditional sources that early China historians did tend to use, and, of course, you rely on archeological artifacts, information, right? But I do notice that in your research, there is a strong component, that is you

use a paleoecology, paleoecological data, and a natural scientific data, and that part of information did not come out from your talk. So, can you speak a little bit about what kind of those unconventional, nontraditional materials that used in your research? And can you say a little bit about, in general, the research methodology that, as historian like you, you have to put together in a combination to produce, in order to produce this kind of a book?

- Okay. Thank you. Yeah, so as I talk about at the beginning of the book, I was studying at Hong Kong University in 1999, and I was taking my first ever Chinese philosophy class. I found this passage in Meng Tzu, in Mencius, that talks about how people have cut down the trees and how there's overgrazing on Ox Mountain, and I was like kind of blown away. Well, I was mainly blown away because I didn't realize humans had damaged environments until the Industrial Era, but also I was like, "Whoa, we could actually study environmental history in the ancient past of China." But then I started reading more into early Chinese thought and found that there are very few other passages like that. Essentially if you try to find people just talking about how we have transformed the environment in this way or that, you don't really find it. It's actually quite rare. And so then I started looking for other sources, and so then I realized that there are, for example, I think I started studying pollen. So pollen is, of course, comes out of flowers and just happens to be a part of plants that is quite sturdy even though they're like really tiny and they get well preserved, and so you can use them to figure out vegetation in the past. And so I've discovered those kind of first, and I started studying pulmonology at McGill, and then I realized that there's climate data and there's macrofossils. I studied macrofossils with Gary Crawford at Toronto, which are seeds. So you have charred seeds and stuff preserved in sites, and essentially then there's animal bones and so on. And so the more I look into this question, the more I realize that the best evidence is not the sort of received tradition from the classic text. It's actually other stuff, including archeological evidence. It's also things like wood. Then I learned about excavated documents and started reading about early Chinese law. I realized these legal texts actually talk a lot about environment stuff, and that's actually what led me, it's almost out of desperation, to this question of political ecology, which was really not, as I said, what I wanted to study at the beginning. I wanted to do just standard environmental history. How did this ecosystem change over a certain period of time? But you realize from just because politics is so central in so many early Chinese texts that politics was actually pretty important in society, and arguably was more important in Zhou, Qin, Han era than it was in many other ancient societies, so it led me towards this question. And in the end I actually took out a lot of the more, there was a big section of the earlier work that was on ecology, and I have published a lot of that stuff separately. So I've published the article on wild mammals of ancient China, written with Kate Brunson, which is just about mammals. Essentially it's the explanation of the image I showed in the

beginning. And then I had a whole chapter about the ecology of the Guanzhong region, which I published in early China. And then so this book just keeps the political narrative, but the key to the political narrative is agriculture. And so then I really got into the archeology of agriculture, of animal domestication, plant domestication, the ecology of human societies and all that stuff. So, yeah, I essentially realized at a certain point that there are specialists working on all this stuff, but there's actually not very many people synthesizing it for audiences who don't know about this kind of data, and so I decided that that would be my job.

- Mm-hmm, and you did a fantastic job. And I would like to encourage all the attendees, our audience for today's talk, in particular to check out the epilogue of the book because in that, I think Brian really laid out your, what you were just mentioning here, this emphasis on political system, not only in order to study the past, our history, right, China's history, but also to look into our future. So political system seems to Brian is the answer to tackle the ongoing climate change. So I think that is very interesting piece of literature in your book. So I don't want to keep you here just in a conversation with me for too long because we do have a lot of questions, important questions. So we have precious 33 minutes left, Brian, and yet we have many, many wonderful questions here, so I would like us to go through them, go through as many of them as possible. So in order to do that, we need to ask you to keep your answer to be more economical. So let's just begin going through the order. So quickly, first, the question because the audience cannot see the question, so I'm gonna read out the question very quickly. So first the question comes from Ogden Ross. "That Qin map at the beginning, one you used, looks like the current extent of the modern Han. Is there simply a extenuation from your historical period to the modern? Were the variations along the way?"

- Well, I think the Han, if you look at the, well, I mean, if you look at the distribution of, for example, native speakers of Chinese, it now includes all of the province that's south of the Yangtze River, whereas in Qin it didn't. So I think one thing that's kind of really historically important about Qin is that Qin conquered all the way from the Yellow River Valley down to the South China Sea, down to the border with what's now Vietnam, and all the way to Fujian, and then it's basically taken the Chinese empires the subsequent 2,000 years to gradually absorb and digest that region. And if you go to Yunnan now, you can see this sort of process of assimilation happening very quickly. So I think that actually that whole region was totally not Chinese then, and it is now.

- Mm-hmm, thanks, Brian. Let's quickly go to the second question by Larissa Kitz. "How does the Qin measure up in terms of its negative effects on biodiversity as compared to other large empires in early history, such as the Roman Empire?"

- Oh, thank you. That's an interesting question. I actually asked Donald Hughes, who was an environmental historian of the Roman Empire, essentially what was the environmental effect of the empire itself, and he basically said there wasn't much of one, and I think that's not true, but it was an interesting reply. But I think that essentially the key to Roman Empire was essentially the peace, the Pax Romana. They conquered the entire Mediterranean and kept it at peace for centuries so that people could, they could colonize new land and they could... Humans multiplied and economic growth occurred, and that means that people were actually replacing natural ecosystems. They were increasing their intensity of land production. But the state wasn't directing it. In Qin and in the Han, I think the state was paying a much more active role, much more planning going on, much more people in the central government saying like, "Let's cut a road through here." I mean, the Romans did a lot of roads, so that's a bad example. But the Qin, and in particular the Han, 'cause the Qin didn't actually have a huge environmental effect 'cause it only lasted for like 15 years. I mean, it lasted for 800 years in Shaanxi, so in that way, it's the longest lasting Chinese dynasty ever, but in other ways, it was so short that it didn't make any difference. But the Han recreated the Qin system and lasted for 400 years, and the Han's impact was very much moving colonizing southward, colonizing the Southeast. I think that the region where Linyi is right now, and Zhejiang, that region was totally alien to the Chinese speakers in the north, people who spoke whatever language they spoke in Henan and Shaanxi at the beginning of the Qin empire, and by the end of the Han empire, it was more or less Chinese. There were essentially the people who spoke non-sinitic languages were up in the hills and everybody in the lowland spoke some form of a Chinese language or Sinitic language. It's popular to say Sinitic, but Sinitic is just the Latin word for Chinese, so I don't put too much emphasis in that. But, yeah, so one thing I emphasize at the epilogue or in the end of the book is that Qin did not have a particularly large environmental effect until after it was gone, and its sort of shadow has continued. Even the current Chinese government's conception of what a good government looks like is heavily indebted to Qin.

- Mm-hmm, can I quickly add something to what you just said, Brian, here? So you brought up the contrast between if the state caused the effects and also the societal-based environmental effects, which are for, the early China, at least, and for Roman Empire, I assume are the same but are less understood, right? So then conventionally we tend to believe, because it's state organized, so we tend to create, generate negative effects, and we tend to believe indigenous societal practices cause less or more positive environmental effects. So there are tons of debate these days about this kind of a bias, which has been carried out by scholars in the past several, several decades, especially by environmental historians right now. So I think there are more and more efforts to go and going into looking at the societal. Actually, look



at China, for instance. The 3,000 years of unsustainable development, which was coined by Mark Elvin and repeatedly used by us to talk about actually Chinese society, people. Ordinary citizens on a rural presence actually committed to damaging biodiversity, just as how the states has been doing. So I think we need to actually bring societal forces back into the conversation in order to make the assessment of the states more meaningful. Of course, it's hard to do for early China.

- If I could just add to that. I mean, one of the issues here is that Chinese archeologists who work on the Zhou, Qin, Han, and later periods really don't care about common people, they don't care about economic productivity, they don't excavate villages, so we know very little about sort of local society, the average person's life in this period. That's one of the reasons my book focuses on politics. I definitely don't think the state is all powerful or is even the most important part of the story at all. It's the one thing that you can tell a story about in ancient China.

- Okay, great, let's move to the next question. So let's bring up the question from Ian Miller. So Ian says, "A general question for Q&A at close. Would be interested to hear you discuss the differentiations across various forms of unfree labors, slave, serve, corvee, et cetera, and the ways they intersected with the gender, ethnicity, regional identities as well as the different types of environmentally engaged work. How do you think about these systems which must change a great deal over your vast time scales in comparative terms?" "Apologies," Ian says. "I may be called into meeting before you end your lovely talk, Brian." Okay.

- That's an interesting question. I think for the question of sort of ethnicity, we really don't know what's going on with a lot of the Qin empire. We just don't have sources on non-Qin or non-Han people to, well, I mean, we have sources on like the northern northerners, but if you think about the people who lived all across the south, archeologists are not really exploring their sort of mountain villages, and they are not mentioned in ancient text, so a lot of the ethnic interactions in early China are really unexplored. I'm actually quite interested in the history of Jiangnan, of the southern, of the lower Yangtze, and there's really so little that we know about this period even though there was so much going on there, but we know almost nothing about it. So I would say that there are whole huge lacunae in our knowledge. In terms of gender, as I talk about a little bit in the book, I think the fact that males came to control society, and you go from societies in which there was some equality of gender, more or less, to societies in which men run the show and have big armies and are telling everyone else what to do, for me, that is actually the most important gender issue. The issue of how the average commoner family divided labor is not going to tell us very much about the environment. It's the bigger societal political issues that make a

difference. I don't really have very anything intelligent to say about the different categories of labor, but it's something to think about.

- To wait for your next book.

- In my book.

- There are many more questions coming up, and I wonder if you and our audience, especially for those audience who are very keen to hear answers from you about their questions, do you mind to stay behind for five more minutes in order-

- Wonderful, I have time too. So, okay, let's go to Steve Perro. "So Brian, what I find from listening to you is historical continuity. Not only can you use present day aerial photos to illustrate Qin agricultural landscapes and Qin wood block prints to illustrate Qin corvee labor, but the kind of labor regimes you talked about were still active in the Dujiangyan area up to the 20th century. Everyone had to participate in the to clear out the canals downstream. Also, the Great Leap Forward illustrated what happened when you relocate too much farm labor for infrastructure projects. What does this say about either ecological determinism or historical cultural essentialism?"

- Thank you. Very interesting question. Well, one thing I would say is that if you look at what the system you described of people being required to do routine maintenance on water systems, you see something very similar in the Netherlands, and you'll see something very similar in regions in other parts of the world in which the maintenance of local water systems was essential for everybody to stay alive, either to protect from floods or to create irrigation. And so to some degree, there's a sort of functionalist explanation there, that that local society is going to need to do that regardless of what happens at the state level, whereas the thing that the Great Leap Forward has in common with Qin is precisely the sort of larger, much higher political... Once you have very powerful political systems, the people at the top can make big mistakes and can tell people to do things that they definitely know at the time are not a good idea, and they still have to do them. So I think those two examples show two different types of logic at work, and all of these things are going on. The other interesting thing, if you think of, I'm sort of saying these types of dynamics were at play over and over throughout Chinese history, but if you look at Chinese history at any given year, you maybe won't see them happening, or you'll see things moving in the other direction. So I definitely don't want to give some kind of, because I'm discussing big structures doesn't mean I think that they're dominating everything that's going on.

- Mm-hmm, can I actually add one sentence here? I wanna bring back what you said at the end of your book. I think this echoes or contradicts, to some extent, Steve's question here about continuity.

At one point toward the end of your talk, you mentioned you actually try not to emphasize that there a long-term 2,000-years-long continuity. What you try to emphasize is how later generation's rulers, states, governments constantly repeatedly resort to the earlier Qin, Han practices, right? Resurrected them and to use them for new purposes. I think this is perhaps a more dynamic way to understand continuity. So I just wanna bring this one point of your talk back into the conversation, but let's move to the next question. The next question comes from Stuart Young. "There seems to be a dearth of interest in mulberry cultivation and sericulture during the Qin as compared with the earlier and the later periods. Is this the case? If so, any idea why?"

- I think. If you look at all the different aspects of the rural economy and what farmers were doing in a Qin village, silk was just one of the things. And, in fact, I think silk is sometimes overemphasized in some of the early sources because silk production was the stereotypical female activity. So if you read the Shijing, The Book of Odes, I think mulberry's actually the most commonly mentioned plant in the entire collection, not because everybody was making silk, but because when you wanted to talk about women's labor, that's what you talked about. But I think that if we look at many, I mean, I would actually argue that farming millet and even cooking millet, everybody was growing millet. Everybody was eating millet. And if you try to find any scholarship on how people cooked millet and ate it, there's almost nothing. And so even more basic aspects of people's everyday life are neglected than mulberries, but I would say that the mulberry, there is some good scholarship, such as Dieter Kuhn's book on how people processed mulberries in early China. But what happens with early China is that you just don't have enough data from any specific period, so you have to do what I do in my book, which is talk about thousands of years and try to draw out the different strings of evidence to make a whole cloth of the picture. And I think if we looked, if we tried to do mulberries in the third century BC, we would find just a few passages or whatever. So I think that's the bigger picture.

- Mm-hmm, thank you. Wonderful, wonderful. Let's move on to Chen Yuen's question, and then Chen Yuen actually wrote down two comments, two questions, so we just gonna pick the first one here. Sorry, Yuen, for skipping one, the other question of yours. So Chen Yuen says, "Hi, Brian. Congratulations again for the book. It is a major contribution to the rising field of environmental history, pre-modern China." Great. "I have some questions about horses and the Qin. Were the Qin horses on par with nomadic horses? Did the Qin engage in any horse trade with either the nomads or other states? What was the utility of horses to an average agricultural household at the time?"

- Okay, thank you. So the earliest record of Qin that we have in the Shiji that I consider to be a real record, as opposed to the like

mythical ancestors that Sima Qian feels the need to give to every single group of humans, is a record of how the western Zhou king enfeoffed the ruler of Qin with a fief out in what's now the Wei River Valley or that area of western, of southern Gansu. So essentially from the very beginning, Qin we're breeding horses, and Qin were way out. If we consider these sort of highland areas, if you look at the place called Qin'an in Gansu, which is the region where the name Qin comes from, there's a lot of sort of high Loess Plateau meadows, and that's perfect horse breeding territory. So Qin essentially came from and always controlled an area that is essentially right on the southern edge of the steppe, almost the steppe, and so Qin essentially is part of that ecology throughout its history even as it moves in and becomes a fully agricultural settlement. As for what type of horses they are, they're probably just more or less the same horses as in Mongolia, which are much smaller horses than we're used to now, but we don't really have, we don't have fine-grained information on horses from different regions. And certainly there was trading going on back and forth between north and south and like between Qin and the people of the pastoralists and between Qin and people to the east and west and south, so horses were certainly part of that. We're talking about hundreds of years, so certainly the Qin's willingness to trade these great war machines to different polities depends on geopolitics. Also very much looking forward to Chen Yuan's book.

- Okay, great, fantastic. Let's move on to Karen Turner's question. Karen Turner says, asks, "Do you agree with Charles Sanft's assent that Qin relied on communication and cooperation," other than, rather than, other than, I guess, "other than brutal force to harvest the sources and maintain order?"

- Basically, no. I think Charles Sanft just ignores all elements, all evidence of violence in the Qin empire and completely fails to address any of the numerous historical accounts we have of Qin's collapse. He just doesn't talk about the collapse because if he had to talk about the collapse, he would have to deal with the fact that a lot of people really didn't like the Qin and that doesn't work with his evidence. So I actually think his analysis of how information moved in the Qin empire is brilliant, but his idea that this is the big thing about the Qin empire is not true.

- Mm-hmm.

- Thank you.

- Actually, I don't really know about that part of argument, so thank you for offering the question and your answer. Fantastic. So we'll skip Chen Yuen's second question here, sorry, Yuen, but let's move on another question. So questions, are two questions. A couple of questions around amended power. So let's say the first one, one is whether the influence of these texts and this model can be traced

through other Eurasia states of this nature and how it related to Assyria. Okay, maybe I could quickly read out the second. The other is about population. So Brian, it's up to you which one to pick, you choose to answer. The other is about population. "Thinking about Jim Scott's model in "Against the Grain" of patriarchy, childbearing as a element in this picture, is it possible to say how this works here? I guess this reflecting part of your talk.

- Right. Okay, thank you. Oh, before I answer those, I did want to mention that Charles Sanft has an excellent article on early Chinese environmental protection laws published in environmental history. I was gonna mention that during the talk. As for movement in Eurasia, I don't think we have, I mean, what's his name? Creel in his book on western Zhou bureaucracy talks about how in medieval, is it Sardinia or Sicily? The kings knew about China's examination system and were trying to implement it, so by that period, by, let's say, the time of the Mongol Empire, you definitely have movement across. Before that, I would say there's very little knowledge of China outside of East Asia. But I think one of the best accounts I've read about this is, I think it's the introduction to the "Cambridge History of China" on the, what's it called? The Mongols and alien regimes or something. But the introduction basically talks about how in earlier periods you have the Chinese empire, you have the nomads, and then you don't really have sophisticated, well, even the nomads, you don't have sort of bureaucratic written government systems anywhere else around the Chinese writing empires. And by the time you get to that period, all around the sort of Central Plains, including Japan, Korea, Vietnam, Burma, all the way up into the nomad areas, you have political systems that are very strongly influenced by the Tang system. And so both the Han and the Tang, I mean, the Han colonized Korea and Vietnam, and those two places eventually broke away and essentially continued some element of Chinese political system. Korea, Japan copied it, and inter-Asian states copied it as well. So I think you can trace many elements of the Qin-Han system to areas across Eastern Eurasia, but not beyond that until much later. Oh, and about patriarchy, my argument in my book essentially is that, and it's sort of a guess, but that if you wanna understand why human societies' states are dominated by males, and, in fact, the word king in the title is a reference to the sort of gendered nature of political system we're talking about, one of the main questions, or the answer is very strongly related to how large groups of armed men became considered essential to human societies. How did armies form, and how did the guy in charge of the army become the person who's in charge of societies? And I think that that's actually essentially large groups of violent guys with big sharp pieces of metal and horses is a key to understanding why men become dominant in society. And I also think that, everyone told me to take it out of the book, but I actually believe that men are biologically more violent than women, and so having societies that are actually run by men has an implication. I basically think the ecofeminists are right. And so I think that, and if you wanna

understand patriarchy, you have to actually go back to the beginnings of states and the beginnings of militarized societies, and that is actually why patriarchy exists. And I really looked into the scholarship on this, and what I came up with is that we don't have enough evidence from early China to ever, or early anywhere, to actually prove that argument, but I think that there's good reason to, you really can trace the origin of male dominance to the origins of highly militarized societies.

- Mm-hmm.

- Thanks for your question.

- At several points, and you actually repeated it, going back to this gender issue that Ian brought up at the beginning. So it seems like this is something quite, can be quite productive if you pursue deeper. And I wanna quickly mention Amanda. Amanda is a historian, medieval historian, historian medieval Europe, working on environmental humanity, so I just wanted to point it out. Your book is now reaching out beyond the field of Chinese studies, so congratulations.

- Great.

- So the next question is from, forgive me if I pronounce your name terribly, Graham Noblit. If I pronounce this wrongly, sorry about that. So Graham Noblit said, "Thanks so much, Brian. So I am doing my PhD at Harvard. I'm curious how you see the state's evolution and shaping of the ecological landscape having impacted social, particularly kinship, institutions."

- That's a question I talk about a lot in the book. Essentially if you look at, well, to go to the broad picture, you sort of have a situation throughout human history, which is the way you form a very strong government is to reduce other elites. So when you have a weaker government, you have powerful people at lower levels of society. So standard feudal model is essentially you have a king, and the king is first among equals. He doesn't actually have any power, but everyone says, "He's our king," but actually he has to depend on all of the people below him. And then once you get a system like Qin, there's nobody who can challenge the emperor because the emperor is in charge of everything. And so throughout Chinese history you have, essentially if you look at the fluctuation of central power, that's the inverse of the fluctuation of the power of the aristocracy or the oligarchy or the elite or whatever you wanna call them. So in the early, before you ever have the formation of a powerful empire, you have essentially power group scattered all over the place, and nobody who controls them all. Qin and early Han, you have a very strong center and that breaks down again. So for most of the medieval period, you have the oligarchy or aristocracy having quite a bit of power and no very strong central government. And then, so for all of Chinese history, that goes up and

down, and so to some degree, kinship is related to that because the more, well, I mean, kinship is always part of political power in every system, and any idea that even modern systems don't have kinship are pretty easy to disprove by looking at all the dynasties in every democratic country, for example. But the point is that you do have this interesting up and down that goes between whether the state is powerful or whether it's essentially primarily kinship groups other than the ruling family. I dunno if that actually answered the question, but.

- You made your point. Thank you, Brian. Let's move on, our next question by Ding Shou-Li. "Hi, Bryan, how unique was the political ecology with Qin in comparison to other warring states? Do you see more similarities or differences?"

- That's a good question, and the answer is we don't know, and we mainly don't know because Qin destroyed the records of all the other countries. So we have some records from Chu, excavated documents, In fact, there has been too little research done on them, probably 'cause they're really hard to read. But for the eastern states like Wei and Qi and so on, we just don't know what they were like. Everything we know about, almost everything we know about them comes through this lineage of like Qin taking their ideas and then Han central government officials sort of looking back at them, which is a sort of lineage, which means that we don't really have independent knowledge of how the other ones worked. But I think what most people would say is that the eastern states like Qi were more commercial, and so the fact that it was this highly agrarian, highly labor-based, highly central, like, the Qin system was based so much on controlling the labor of individuals and controlling what they did because there was not a commercial system that they could extract resources from, so you could imagine if Qi had defeated the other ones, that the whole Chinese political model would have had a lot more space for commerce and for sort of private capital and that type of thing, whereas one of the reasons it didn't is because Qin set up the model. And then the Han, after the Qin collapsed, the Han set up its government in the capital region of Qin, thereby sort of perpetuating that model of governance even though the rulers of the Han empire are actually from Chu, so they in theory could have done something different, but in many ways they kept the same model.

- Mm-hmm. Mm-hmm. Thank you, Brian. I hope Mark, who runs the show really, the real person to organize this event is okay we extended the event few more minutes because we have so many questions, but let's try to be economical and try to finish as many as possible. So here comes our friend Mindy Schneider. So Mindy says, "Hi, Brian and Ling. It's so nice to see you both, and thank you for a great talk. Can you talk more about how pigs, chicken, and dogs weren't taxed? You said that the state couldn't find a way to tax them. Why is that? So was it social, ecological, cultural, dietary, all of the above?"

- Thanks. That's a good question. There are actually some laws that say, that talk about, for example, a local government office might own its own chickens or its own pigs, I think, but definitely chickens, and so there are rules about where the money goes if you sell some of those chickens. But my theory is essentially that you had these little villages. There were chickens running around. There were pigs running around. Maybe they were starting to put their pigs in pens at this time, but most families just had a few chickens and maybe one or two pigs, so there's not really way a local government can, they can't just like, they can't just say, "Give me one leg of your pig," right? So I actually think, and this gets to James Scott argument, his argument in "Against the Grain," which is essentially that grain is a key thing for political formation because of the way you can just take a certain quantity of it, store it, and it's still good, so on. So essentially the state really focuses on commodities, very few number of commodities, that are easy to move around, easy to store, easy to collect a certain percentage of and so on, and so the idea is that chickens and pigs just didn't work that way.

- Thank you, Brian. This is really wonderful. And I'm gonna skip the next question, comment, because we mentioned the, we got a question from the same person, so we're just gonna go to another person, Benjamin Gallant. "So thank you for the fascinating talk. One thing that appears often in transmitted texts is the production of hemp or soak cloth by women. But we have women, again, but that doesn't seem to be as important in Shuihudi co-ops as the granary. How should we think about the political ecology of cloth production?" So this is related to the previous question that you answered, I think, to some extent.

- Thank you. Yeah, I wonder about that too. I think the answer is simply that some parts of the empire probably specialized in producing hemp, and so in some places, actually the Yuelu texts, which people don't like to study because they were stolen, they actually talk about people paying their hemp taxes, so people did pay tax taxes in hemp. And I would wager that there were certain parts of the empire that were really good at producing silk that paid all of their taxes in silk. And so I think that the grain model was a standard model, but there was probably certain regions that did things a different way.

- Mm-hmm. Thank you, Brian. The next question comes from a archeologist, Michael Storozum, and I just realized, actually, this scholar is from Newcastle University, and I'm just, oh, wow. I actually I spent a year teaching at Newcastle University back in 2008, and I feel a little bit nostalgic seeing this post. So, "Hi, Ryan, this is Mike Storozum, Newcastle University. Really wonderful talk. Thank you. I'm particularly interested in the use of archeological evidence to construct the narrative around the change use of irrigation, like your Zhengguo Canal and Dujiangyan, to conquer



neighboring kingdoms. Do we have good estimates? So for the amount of the land and crop that these projects would have produced on annual basis, do you see this as being a major catalyst for Qin's growth?"

- Thank you. So to start at the end, definitely this was a catalyst for Qin's growth. Sima Qian basically says that the building of the Zhengguo Canal is what made Qin strong and allowed it to conquer its enemies and become an empire. So he just says straight up, "This is a really big deal," and it was because it was right beside the capital of Qin in the middle of the Guanzhong Basin. So to have a reliable agricultural production area there regardless of our droughts was a big deal. But our sources on these projects are really terrible. I mean, what we know about the Zhengguo Canal is essentially a romantic story from early China that is probably fictional, and the numbers in it don't make any sense. I have a section in the book on this, the end of Chapter 4, I think, that's all about like, what does this number mean? And my answer is that the number probably doesn't mean much of anything. And for the Dujiangyan Canal, there aren't even records of that existing in Qin. There aren't records from the time of Qin. And I think, yeah, essentially the records and Sima Qian, it's like three or four characters total about it. He just basically says, "Qin sent this guy and he did this water system," so we know nothing whatsoever. And even in centuries later, even if you go 500 years later, and look at everything that is available on Dujiangyan, it's just a few sentences, and so actually we know nothing about it. And the archeological record is pretty terrible too, I mean, what people have actually looked at. So the answer is that we don't know very much. There would have been small scale water control works all over the empire that we literally, I'm sure that they existed, but apart from that passage I showed about dikes, we don't even have evidence of local people using irrigation at all. So, yeah, we were waiting for you geoarchaeologists to show us what was going on.

- Brian, listening to your answer, make me feel, as a medieval historian, I feel like I should not complain about the shortage of sources at all. Thank you for your. So let's go to Tom Chase. Tom Chase asks, "Advances in metallurgy in Eastern Zhou and Han and have been connected to social mobility and increasing wealth in the middle class. Can you say more about location of the metal resources and the development of iron in Eastern Zhou, Qin, and Han?"

- Big questions. My general theory, basically, when I started studying this type of thing, I was reading a lot of Chinese scholarship on metallurgy, and they put so much emphasis on the social effect of metallurgy. I think this is essentially Soviet style kind of, like in the Soviet Union, they essentially had technological determinism as their main, they didn't want class to be part of their main Marxist analysis, so they put all the emphasis on technology. And so Chinese historians followed that and just said, essentially like, "Metal changed everything," and I just think that's not true. I actually

think that the beginning, like the beginning of metal in the Bronze Age made a huge difference. The fact that some people had sharp weapons and horses and other peoples didn't made a big difference. But when you get to the switch between bronze and iron, it's harder to say that it had some kind of absolutely enormous effect on society, but certainly if it did have an effect on society, it would've happened in the early Han dynasty and not before because that's when iron becomes really widespread, because the state starts producing iron tools for everybody. So it's possible that agriculture improved at that time. So that's sort of my theory. I think that if we wanna talk about that story, it should really be focused on that period. As for where they got the metals, we know there's a lot of copper in Hubei, for example, but there's still a lot of questions about where some of this metal was coming from. There's a group at Cambridge working on these questions, doing analysis of metals, and they're telling us more and more about this, so we're gonna learn more about it in the future.

- Mm-hmm, mm-hmm. Fantastic. Okay, wonderful. And I'm gonna skip Steve. Steve, your question, actually, this is more like a challenge, Brian. So Brian, maybe you can practice privately and go back to sleep to try to give us a social, political, economic history, early China, in two minutes, ha ha ha. So you're gonna do it with Steve the next time you meet, I assume. Let's quickly bring up the next few, just two question. Wonderful work. The next questions from Tim Newfield. "Wonderful talk. Thank you. I was going to ask a similar question as Professor Ling Zhang. I'm a bit of a outsider here. Synthesis of phynological data.

- Palynological.

- Right, my mind. Data are currently reshaping what we think about Roman in innate and antique land use, and the land use change over time in the Mediterranean region, our palynological data changing what has been said previously on the basis only of written archeological sources in the Qin empire. And if evidence from the natural sciences does not fit neatly with the other sources, how do you handle data from different fields that are, or seem to be, contradictory?" This is a great question.

- Yeah, that's a good question. So, well, it seems to me that in China, palynology was really popular like 20 or 30 years ago, maybe 20 years ago, when they didn't have any big fancy machines. They just had microscopes. So they would go out and get soil samples and look through them for pollen samples and do these pollen analysis. Now people are not into pollen in the same way. They use it as just one more climate proxy, or they're just like, "I'm now interested in this wetlands of Central China, which should be ideal places for preservation of pollen," and there doesn't seem to be anyone working on it at all. So essentially I feel like people move towards speleothems, so which are like stalagmites, which are really like kind

of sexy in the field of climate studies now. Palynology is seen as some kind of boring, old technology that people don't use very much. But even more so, there still hasn't been a real synthesis in China of all of the different types of environmental science and archeology. They tend to work separately, and the science people tend to be asking, they tend to be sort of doing a pollen analysis of thousands and thousands of years and then doing like a pollen chart. They're not going to specific sites, analyzing the pollen with the archeologists, and then trying to figure out like, "What was this site like?" like they do in the Mediterranean. And so essentially I think that Chinese archeology has a lot of work to go in that direction, but as I said earlier, people who work on the historic period in China don't do archeology on common people at all. They mostly just study tombs and big cities. And so basically looking, it's almost as if they're just searching for treasures to put in museums. And I actually asked the head of the Shaanxi Archeology Bureau about this once, and he just said, "It's not us. It's the bureaucracy. Like if we tell 'em we're gonna dig up a village, they're just gonna put that on the bottom of the pile. They don't care." Trying to explain socioeconomic history using archeological tools is not something that the bureaucrats who decide what gets excavated in China care about at all, and so essentially that whole sort of form of archeological analysis is not happening for this period. But the thing that makes it very frustrating is that they do this type of stuff for the Neolithic. So Neolithic archeology in China is really, really good, and they actually bring in all the tools, and they do great stuff They excavate small villages. But for the historic period, they don't do that kind of stuff at all, so it's rather frustrating, and that's actually my, the whole structure of my book is designed around the fact that I have all this evidence for the Neolithic and then I just don't for later periods. Great question, though.

- I wanna quickly add, Brian, based on very limited archeological tools that I participated, so it's a similar kind of experience. A lot of the artifacts actually were dug up and a popped in the backyards of the at the local level and a nobody bothered publishing anything about them, so as scholars, as historians, you couldn't really access those data, so same situation here. Great, and so I wanna very quickly bring up the last question. So, oh, yeah, Brian, you typed something? Let me bring this up, the last question from Terry Kleeman. Terry says, "Actually there are Han-era statues of Li Bing that give more information on Dujiangyan. Found archeologically." Oh, okay, "Not a question. "Please just show to Brian," so but I read out publicly, so.

- No, that's very good to know.

- Would be helpful for our archeologist, Michael Stokes... Gosh, my mind is so slow. Storozum. Storozum.

- I would expect that those statues still would be more like that guy

was really awesome and not like it irrigated exactly this amount, you know?

- Okay, great, but nevertheless, thank you, Terry, for supplying that information. So, Brian, you answered all the questions, and so thank you everybody for participating in this event and for contributing your thoughts and questions and your suggestions, shared information. And thank you Mark Grady at Fairbank Center in Boston. Thank you for staying for a much longer time with us, allowing us to finish all the Q&A, and, of course, thank you, Brian. This is such a wonderful opportunity for you, for us to learn about your new book and the entire apparatus, your scholarship. I'm so glad the book comes out in such a beautiful way, and I hope many, many people around the world read it. So thank you for being here.

- Thanks a lot to you and the Fairbank Center and Mark. This has been great.

- Wonderful. So everybody, if you're interested in the book, reach out, or you have more questions, reach out to Brian. And I just wanna quickly mention for if you are interested in following us, and we have several other interesting events coming up, so please checkout the Fairbank Center's website to look for our future events. Thank you, everybody. Happy New Year for the Year of the Tiger. So I will see you more often in the future. So Brian, take care.

- Thank you.

- You too.

- Thank you, Mark. Bye.

- Bye.