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## Roundtable studying the Anthropocene in Central Asia: the challenge of sources and scales in human–environment relations

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### ABSTRACT


The emerging and vibrant field of environmental humanities to date has not received considerable attention in Central Asia. In light of the Anthropocene crises, there is a real urgency for maturing this field and investigating the methodological and epistemological challenges that environmental topics demand, often working across disciplinary habits and time scales. This roundtable brings together Central Asianists from a range of backgrounds to discuss the sources and scales of their investigation, their challenges and potential. The contributors discuss how particular kinds of sources such as climate models, archival manuscripts, ethnographic fieldwork and media analyses have been used to understand environmental changes in the region. In what ways do the traditions of scholars' disciplinary training guide the scale of analysis? Looking toward the future of environmental humanities in Central Asia, this roundtable suggests paths for developing this vital field of enquiry.

### KEYWORDS

Environment;  
interdisciplinarity; sources;  
scale; Anthropocene;  
environmental humanities

## Introduction

Captured by the climate change debate, we are witnessing a sense of crisis that brings to the fore existential questions about past, present and future. The notion of an 'Anthropocene' (Crutzen and Stoermer 2000) as a time in which humans have become a 'geological force', permanently altering the Earth's environment, underpins many of these current discussions. The idea of an Anthropocene invites not only sobering accounts of the past, but also an awareness of how our collective behaviour now affects – often catastrophically – other species and, consequently, the very basis of human nourishment and

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health.<sup>1</sup> If our economic behaviour, technical inventions and ideas of a good life over the last two centuries have become a threat to humankind, then scholars of the humanities, social and environmental sciences have the task of asking: How, why and where did this situation come about? As the Anthropocene extends into the future, what past and present experiences can become repertoires for liveable alternatives (Robin 2013)? Clearly, 'environmental issues' are inescapably also human and political issues. In answer to these challenges, over the last decade the field of environmental humanities has established itself as vibrant and diverse. Proponents seek to highlight 'questions of meaning, value, responsibility and purpose' through streams such as political ecology, ecocriticism (literary studies) and posthuman geographies (Bird Rose et al. 2012, 1). Though the environmental humanities seem to foreground the humanities, the field in fact explicitly embraces interdisciplinarity between the humanities, social and natural sciences. As a broad church with an ethical agenda, the field also has many affinities with fields such as science and technology studies, multi-species studies, feminist, queer and postcolonial studies. Therefore, what kind of environmental issues have Central Asianists engaged with? How might an environmental humanities approach help us realize greater environmental justice in the region? What might be the methodological challenges and rewards in doing so? This roundtable aims to highlight the potential of this emerging field – also well beyond a 'crisis' mode. Our goal is to reflect critically on how best to take up the challenge of studying Central Asians' relations with the huge variety of environments, species and climatic contexts in which they have long made their lives.

In Central Asia, we are increasingly seeing the long-term consequences of twentieth-century human activities such as dam-building, mining or quasi-'industrial' pasture use. We are also witnessing increased recognition of this impact in different kinds of environmental movements, from the Aral Sea and Polygon protests of the 1980s to new urban air pollution activism. Both the global context and contemporary local concerns thus expose a real urgency in studying human–environmental relations in the region. At the same time, environmental questions pose particular methodological challenges to scholars trained in the humanities and social sciences. Social analyses of Central Asia were long captured by other themes, in particular in the field of political history, the study of identities and nation-building, and the history of Islamic ideas and practices. This emphasis both mirrored the concerns of Central Asian governments as well as those of 'outside' funding bodies since the 1990s. Despite some pioneering work by social anthropologists such as Bunn (2010), Ferret (2009) or political analysts such as Weinthal (2002), for a long time human–environment relations and struggles looked somehow marginal to more obvious, 'purely' social or economic tensions and conflicts. The wide field of human–environment relations was left to 'specialist' disciplines such as geography, biodiversity conservation or agricultural development (e.g., Bichsel 2009; Djanibekov et al. 2018; Sehring 2020; Xenarios et al. 2019).

There is now burgeoning interest among Central Asianists producing studies in dialogue with the emerging and rich field of the environmental humanities (e.g., Breyfogle 2018; Frachetti 2008; McGuire 2017; Stawkowski 2016). On the other hand, questions about the environment bring about distinct challenges for scholars trained to think of themselves as experts on humans who consult human sources and work with the scaling parameters of 'human' histories and territories. If we already struggle with

the complexities of these dimensions, then relations with a particular non-human environment may look too 'big' or ambitious a topic to deal with. And yet attention to pre-Soviet, Soviet and contemporary approaches to understanding and using Central Asian environments can provide a highly fruitful framework and longer term perspective on precisely these conflicts. There are, for instance, important questions to be asked about the link between the opportunities and limits of environmental life-worlds and economic or migration dynamics – decidedly beyond a simplistic 'resource scarcity' framework.

Facing these opportunities and challenges, the following discussion is meant as a collective reflection on the nature of suitable sources and 'fitting' scales of analysis, both spatial and temporal, in the light of the region's specificity. For instance, how does one limit, spatially or temporally, an investigation into uses of the steppe – or indeed into the way the steppe was and is conceptualized? Our premise is that both scales and sources of investigation are an effect of social convention, historical sedimentation and *choices* made by researchers: conventional units of analysis and *corpora* of texts of various kinds have their own histories. Scholars are taught to self-consciously consider in the definition of their own research hypotheses and the selection and interpretation of their source basis (Caswell, Punzalan, and Sangwand 2017; Delsalle 2017). At the same time, though, the same scholars must be aware that by doing so, they contribute to the delimitation of analyses and the orientation of their field. These points raise fundamental questions well beyond our research processes about basic units of analysis which form the object of investigation. For example, is the *environment* in a study of riparian ecologies a different concept from the *environment* in urban geography (Kopnina and Shoreman-Ouiemet 2016)? Similarly, assisted by new information technology (IT) tools such as geographical information system (GIS) and remote sensing, the study of 'landscape' is redesigning the research questions not only of archaeologists but also of historians and geographers (Kreutzmann and Watanabe 2016). Faced with these new tasks, our disciplinary 'toolbox' is thus under question.

Researching people in relation to their non-human environments challenges cherished disciplinary forms of schooling, expertise and divisions of labour: Can anthropologists speak authoritatively on the spread of disease or contribute to understanding 'water scarcity' in Central Asia? How can historians use climate models, as Jeanine Dağyeli describes below? And what about natural scientists: When and how might they seek out qualitative data on kinship or political organization in explaining environmental degradation or health demographics? Can oral history become an acceptable source of local environmental experience and knowledge for a forest ecologist? Considering the need to consult a wider range of data – sometimes as unfamiliar as meteorological recordings – some researchers may doubt their own competence or balk at the significant time-investment needed to integrate new skills and forms of investigation. And – as it often happens in Central Asia – they may simply be confronted with the limited serial data available. Researching these topics across disciplinary boundaries and established models of analysis is thus both rewarding and challenging. During a roundtable at the 2019 annual conference of the Central Eurasian Studies Society, we asked six scholars studying a wide range of human–environment interactions to reflect on their research practice and struggles around questions of source and scale.

### *Introducing the question of sources*

A particular type of source relates closely to the research questions asked, and the temporal and spatial scale the latter are worked on. A mutual feedback exists between the 'intelligibility' (often literally) of a *corpus* of sources and the thrust of a question. There are also scaling conventions attached to different disciplinary traditions, such as archaeology (the 'deep past') or social anthropology (the contemporary, intensive micro-studies). How does the chosen scale shape, or even dictate, the direction of research? For example, consider the asymmetry between studies of Central Asian irrigation and water usage by anthropologists and historians: small-scale contemporary studies are much more able to tackle issues of social relations, meaning, and value systems. Historians dependent on institutional archives tend to look at political units, administrative divisions or, at best, watersheds. This makes some questions in the cultural history of water hard to answer, while the embeddedness of water usage in social relations is also difficult to ascertain. Conversely, the scale and sources adopted by historians are more suited to exposing overarching power relations and wider normative frameworks; they are also able to track change (e.g., new irrigation or water scarcity) more systematically. Historians explain these choices by discussing the constitution of archives (Pollock 2008; Sahadeo 2005; Sartori 2016), or the sheer impossibility to carry out any participant observations. Anthropologists meanwhile may argue from their training and the need for up-close analyses of social complexity to explain their choice of scale. A degree of self-reflection combined with a willingness to look beyond one's field helps to identify gaps in their respective research design. Yet transcending boundaries is possible, as highlighted in particular in Amanda Wooden's contribution below.

### *Introducing the question of scaling*

As geographers and environmental historians have argued, there is no such a thing as a 'natural' scale or border (Swyngedouw 2000; Weiner 2005). Scholars have pointed to 'scale' as a produced classification, generated by a particular epistemology and for particular purposes (Smith 2008; Waklid 2014). Environmental history questions are often pitched at a scale that is not coextensive with any administrative unit, whether national or subnational (McNeill and Roe 2013): natural phenomena can hardly be studied within the straitjacket of historically changeable political boundaries, particularly 'mobile' in Central Asia (Gorshenina 2012; Haugen 2003; Raffestin 1980). At another level, how might local weather data be newly relevant to 'global' climate change sciences? Studying environmental questions can thus help to denaturalize and complicate ideas of territorial cohesion, division or connection (Green, Harvey, and Knox 2005).

Naturalized assumptions nonetheless play into ideas about what spaces are considered 'core' or 'periphery'. In the case of the most hegemonic spatial scales in use (i.e., the region of Central Asia, the nation-state or an oasis), we also face the problem of needing alternative units of analysis to discuss, for example, the effect of organizing the environment. Similarly, assumptions about being able to 'scale-up' and generalize research findings from, for example, one river basin to a continent,

across cities, or from a number of villages to agricultural Central Asia has long been problematic. As Anna Tsing argues, there may be tremendous downsides – in life as in science – to copying ‘streamlined’ administrative units because these can blind us to complex relationships and change (Tsing 2012). Connected to this hierarchy of analysis, there has been a call to ‘rescale’ governance solutions, especially on environmental issues (e.g., Ostrom 2010).

Deep-seated ideological assumptions on environmental scales are not anodyne. Assumptions built, for example, into Soviet practices about resources, collective versus individual agency, faith in science and human purpose affect environmental management as well as the way environments have been conceptualized in the arts and popular culture. While the very notion of ‘Soviet’ Central Asia therefore remains useful, it also deserves questioning: To what extent can the experience of authoritarianism (and specifically Communism) both engender a distinct unit of analysis, and separate it from spaces that were spared it (Josephson 2004, 98ff.; Weiner 2017)? Can this notion be extended in time to be used in the study of pre-Soviet periods? Recent work on irrigation has shown that this exercise can help identify the many continuities in principles and practice (Oberreis 2017; Peterson 2019).

The scaling of disciplines is also telling: natural, quantitative and qualitative data researchers identify differently with Central Asia as an object of analysis. As reflected in *Central Asian Survey*, applied researchers, for example, in the agricultural sciences or physical geography, tend not to adopt the label ‘Central Asianist’: they more often identify with distinct climatic zones or environmental elements, such as the cryosphere or pastoral livelihoods, often working in at least one other world region with an equivalent ‘zone’. The conventions of these disciplines do not encourage a focus on Central Asia that links these ‘zones’ to others, such as irrigated agriculture. Other possible markers of similarity or connectedness, including religious traits, patterns of trade or shared principles in economic policy, are thus often overlooked. At the same time, it is striking that in Central Asia itself, some of the work that most closely corresponds to the global understanding of ‘environmental humanities’ is produced not by academic historians or anthropologists, but by environmental activists with a background in the pure or applied sciences such as the late biologist Emil Shukurov, who fought for walnut forest conservation in Kyrgyzstan.

Attendance at conferences similarly mirrors scholars’ patterns of identification: our CESS roundtable thus featured mainly students of the humanities and social sciences. In this roundtable, we highlight the benefits of attending to pertinent humanities and social science research on Central Asian environments, while also advocating greater inclusion of quantitative and natural science perspectives on human–environment relations. Looking toward the future of environmental studies from a humanities perspective in Central Asia, our commentators develop visions for stimulating this crucial field of enquiry. We contend that reflecting on the available sources and useful scales for examining human–environment relations brings to the fore key questions about the assumptions embedded in disciplinary conventions about human causation. The question of sources and scales reveals what kind of social organization is considered to matter ‘the most’: is it the nation-state or something else? In other words, the debate in what may seem a ‘niche’ and rather abstract interest in the environment highlights critical questions at the core of much broader scientific practices.

## Roundtable participants

*Irina Arzhantseva, Principal Researcher, Institute of Ethnology and Anthropology, Russian Academy of Sciences, Moscow; and Heinrich Härke, Professor, Centre for Classical and Oriental Archaeology, Higher School of Economics University, Moscow, Russia*

As archaeologists, we came initially from different research specialisms and backgrounds in the Russian academic and British university systems. Over the last decade we worked together on questions of Central Asian archaeology, with projects focusing on fieldwork in an early medieval town (Dzhankent, Kazakhstan), and on the history of Central Asian archaeology, digitizing and analysing what is probably the largest archive in this field: the Khorezmian Archaeological–Ethnographic Expedition of the Academy of Sciences of the USSR in Moscow. In our fieldwork we pursue questions of urbanization in close cooperation with scientists from various fields (geophysics, soil science, geomorphology, palaeoclimate and zooarchaeology). In our archive research, the initial focus on ‘mining’ strictly archaeological information has broadened into an active interest in the political and social contexts of Central Asian archaeology, and in the personal histories of actors in this field. We are now both teaching in Moscow in the new Center of Classical and Oriental Archaeology at the Higher School of Economics (HSE) University, pursuing many of our Central Asian research interests in class.

*Jeanine Dağyeli, Assistant Professor, Nazarbayev University*

I take up the question of sources and scales in research of Central Asian environments from a historical anthropology project I have been working on for several years: the moral economy of land and water in nineteenth- and early twentieth-century Emirate of Bukhara. This territorial entity was finally dismantled in 1924 and its land divided between what are today Uzbekistan and Tajikistan, with small pockets in Turkmenistan. Some of the questions asked during this research are of relevance for this roundtable: What did natural resources, environment and weather mean to pre-Soviet Central Asian communities? How and when were environments valorized (and for which purposes) or how might they fall into disuse? How did people handle environmental threats to their livelihood (as diverse as drought, flooding, agricultural pests, earthquakes, etc.) and how did they assess potential risks and benefits? Through which parameters did they establish, organize and maintain their relationship(s) with the environment? Additional reflections come from an anthropological project on environmental narratives and future aspirations in anthropogenic environments that I am currently preparing in Kazakhstan as a member of Nazarbayev University, Department of Kazakh Language and Turkic Studies.

*Eva-Marie Dubuisson, Assistant Professor, Nazarbayev University*

My interest in environmental issues in Central Asia stems from previous linguistic and ethnographic research on oral traditions, ancestral landscapes and dialogues, as well as Kazakhstan’s sacred geography (pilgrimage and narrative). My thoughts here are based on a series of projects (2015–18) concerning cultural landscapes and discourses of

social and environmental protection in Kazakhstan. While Kazakhstan has suffered tremendous ecological damage from decades of natural resource extraction-based economy (as well as other catastrophes such as nuclear testing and, with Uzbekistan, the Aral Sea disaster), mobilization around these issues has historically been an effective form of political participation. Environmental discourses in the country tend to bring together multiple and overlapping discursive frameworks, including the (inter-)national legal frameworks of the United Nations, energy economics, the legacy of land and bio-species conservation in (post-)Soviet spaces (natural parks projects and protected zones), as well as a nationalized moral paradigm of respect for ancestral lands and the country's cultural heritage.

***Akira Ueda, Research Fellow, JETRO Institute of Developing Economies***

My main question is how the nomadic system of economies and oasis economies changed to the current system throughout the Russian colonial era and the Soviet period. The natural environment in Central Asia was one of the most important factors in this process. My 2017 dissertation focused on the interrelation between the settled population in the Ferghana Valley, the centre of cotton planting, and the piedmont area where Kyrgyz semi-nomads and the Tajik population mainly lived. I have since started analyzing the demographic problem of the Kazakh Great Famine focusing on the cotton region in southern Kazakhstan. So far, results show that the cotton economy not only changed the oasis areas but also affected the lifestyle of the nomadic population. This could partially explain the historical multiple routes to sedentarization.

***Amanda Wooden, Associate Professor of Environmental Studies, Bucknell University, Pennsylvania***

My work centres on understanding environmental narratives that come to matter politically and exploring how the ways people think and *feel* about 'the environment' shapes and influences discourses, activism, environmental disputes and political outcomes. Waterways, mining, climate change and environmentalism are the focus of my attention, as topics of concern to people in Kyrgyzstan and the United States (where I comparatively teach and conduct research). For the last decade, the Kumtor mine and the glaciers it damaged have been my main topics of study. The glaciers became political actors, through news coverage, via activist presentations, and people sharing images and videos in social media conversations and offline on DVDs. Learning about this process from people in Kyrgyzstan shaped my theoretical focus on visual culture, symbolism and emotional political ecologies. As a Fulbright Global Scholar (2018–21), I am studying glaciers and mountains historically and bioregionally across national borders in Kazakhstan, Kyrgyzstan and Russia.

**Sources: discussion**

We asked roundtable participants to explore the limits and challenges of the sources they use, and how they might interrelate. In what ways do the traditions of scholars'



disciplinary training guide the scale of analysis? How might a shift or combination of scales of analysis – and their corresponding sources – cast a light on issues that would not have been seen otherwise (Faubion and Marcus 2009; Pianciola 2017)? In a pattern that seems to follow the humanities versus social sciences cleavage, for some researchers it is almost impossible to separate the question of source and scale (e.g., Heinrich Härke and Irina Arzhantseva). For other contributors such as Eva-Marie Dubuisson, a discussion of scale is indeed a separate question, while Akira Ueda argues that deconstructing the scale suggested by the sources is one of the researcher's tasks.

### *Eva-Marie Dubuisson*

In order to understand contemporary environmental discourses in Kazakhstan, I conducted several years of fieldwork-based research (2015–16), together with a student research team from Nazarbayev University. Our team alternated between periods of field research and transcription, focusing on three primary areas: governmental and non-governmental structures of environmental protection; legal and social activism and discussions on social media; and fieldwork travel to natural and historical sites. We worked with a number of individuals and organizations to collect data for the project as well as to understand the complexity of environmental management and activism on the ground. Our goal was to collect language-based data (text and narrative) in order to study emerging conversations around environmental protection over time. We chose as a structure the Aarhus Convention framework, adopted by Kazakhstan in 2001, which in cooperation with the United Nations Economic Commission for Europe instituted a series of regional offices and a hierarchical reporting protocol on environmental affairs in the country. Aarhus stipulates three primary goals: public access to information about environmental affairs, public participation in environmental decision-making, and access to environmental justice. Our group sought to understand how these principles might be implemented at a local or regional level with relation to the framework, but also how models of safeguarding and activism *already exist* in a particular cultural and historical context, in order to challenge the notion that frameworks of environmental protection have to be 'imported' from outside. In Astana we worked in particular with the central Aarhus office, with its wealth of statistical data on the ecological situation in every region of the country, as well as its relation to environmentally related illness and death. We followed the work of the Association for the Conservation of Biodiversity in Kazakhstan and the United Nations Development Project Kazakhstan, which are responsible for massive national parks protection projects such as Altyn Dala (ACBK) and Balkash, Mangystau, and many others (United Nations Development Programme – UNDP). We gathered all the publicly available information from every national park in the country to build a corpus for analysis. We interviewed local non-governmental organization (NGO) leaders and ecological activists, as well as scientists and educators, in three different regions: Almaty, Kokshetau/Burabai and Atyrau (I had previously conducted similar research in Kyzylorda, which was also included for context in this project). With the help of the legal organization Green Salvation in Almaty, we met with citizens participating in the ongoing Kok Zhailau protests there. We also went on two pilgrimage or expedition-style trips to sacred archaeological and natural sites, which are targets of international UN-level protection and ecotourism.

My own subsequent analysis (2016–18) has centred primarily on language and discourse. The sources were of two primary types: information from project descriptions and public websites, and conversations and interviews with project participants. The strength of a linguistic approach is to bring these different levels of sources together, by a concrete comparison of the actual terms, phrases and topics of discussion being utilized. It is possible to provide evidence for emerging, changing, or overlapping discursive frameworks. From a linguistic perspective it is critical to realize that environmental discourses also take place within and across languages, which index particular social and historical worlds and worldviews: all terms and phrases have different connotations. For example, the term ‘steppe’ itself has different definitions and valences in Kazakh, Russian or English – from lifeway, to ecozone, to romantic imaginary, from historical or indigenous to colonial or global perspectives: we cannot assume one understanding.

### *Amanda Wooden*

One of the puzzles that motivated my research into Kyrgyzstan’s environmental politics was witnessing politicians, journalists, corporate actors and some scholars dismiss environmentalist attitudes as inauthentic and unimportant. Once residents’ concerns about a particular hazard or crisis in Kyrgyzstan (as in the United States) reached national-level attention and the policy process, residents’ realities, activism and complicated perspectives were at best lost and at times criminalized. Thus, I sought to listen to people’s complicated views and sit with the contradictions to understand why and how industrialization divides communities and creates these paradoxes, and add dismissed environmental perspectives to scholarly and policy conversations.

Previously, in seeking to gain a wider understanding of what different people in Kyrgyzstan thought about ‘the environment’ and waterways, and which issues mattered to them, I used opinion surveys and in-depth interviews with a wide range of respondents, complemented by event observation, as many political scientists do. I was trained to study social processes in a way that allows generalizability, something that only quantitative scientific data, quantifiable surveys or a lot of time can provide. The survey research I conducted provided understanding of trends and patterns, and many people’s ideas and concerns. By spatially analyzing the survey results, I was able to visualize the geographical dimensions at work, as Irina Arzhantseva and Heinrich Härke’s unique geoarchaeological approach valuably does. However, I found myself dissatisfied with the incompleteness of what I learned, which was limited in revealing answers to my more complicated research questions, such as causal relationships. Interviews and informal conversations were much more compelling and insightful for the questions I sought to answer, especially to understand the complex, emotional aspects of politics and environmental issues. Thus, I turned to visiting more communities to understand particular contexts, conducting hundreds of interviews and event participant observations, developing deeper relationships over repeated conversations and time spent in particular places. Through these research approaches, I learned to listen for peoples’ emotions regarding environmental politics, the power of affect and of symbolic representations. Recognizing the limitations of survey and other quantified research, and problems with common political science methodological conventions, I shifted the course of my work into a decidedly more interpretive, inductive approach.

Research participants in Kyrgyzstan and the United States drew my attention to all the topics I came to study, and pushed my methodological evolution, along with my parallel philosophical shift. Critical geography, environmental history and applied anthropology scholarship influenced this change into what I call critical political science. This dissatisfaction and epistemological self-transformation process led me to search for more participatory ways to conduct research and flip interviews in favour of participant-led conversations, such as my current photo voice and photographic ethnography approaches and interest in visual culture. Each round of research, across all these methods, including the surveys, led me to recognize environmental issues about which people in different parts of Kyrgyzstan were worrying, to hear about those worries and follow them, listening to what people were telling me mattered to them. Doing this research slowly over time revealed dynamics of social narrative shifts and public mood changes, in relation to formal political processes and the narratives used by politicians, miners, environmentalists and journalists.

### *Irina Arzhantseva and Heinrich Härke*

Unlike others in this roundtable, we seem to be the only ones using material evidence from archaeological contexts, in addition to archival data, although we would not go as far as to fully adopt the 'material turn' in the humanities and ascribe agency to artefacts.

Our fieldwork is located in the eastern Aral Sea region, mainly in the delta of the Syrdarya; the key site of Dzhankent is an abandoned town with multi-period use.<sup>2</sup> It provides palaeobotanic, micro-mycological, pedological and geomorphological data illuminating environmental and economic changes from the sixth–seventh to the tenth–eleventh centuries. In archaeological fieldwork, we do not consciously select the data: we select methodologies appropriate to the site and our working conditions (including funding), which in turn produce different types of data. Thus, we have, with conventional archaeological methods, opened several trenches in the town and immediately outside, giving us finds and evidence with stratigraphic contexts, including entire buildings and their interiors. Realizing that we would not be practically able to apply this method to the entire site covering 16 ha with up to 6 m depth of cultural layers, we switched to a geomorphological–pedological methodology, that is, systematic coring on a grid across the town. This will give us less detailed but more widely spread evidence about the history of use of all areas within the settlement, including dates for occupation layers, together with data on the changing environmental context. In the analysis phase, archaeologists cooperate with scientists, matching environmental (i.e., scientific) data to archaeological (i.e., cultural) questions.

Our main archival source is the archive of the Khorezmian Archaeological–Ethnographic Expedition, active in the Aral Sea region from 1937 to 1993. Its biggest and most valuable part relates to its 'golden era' under legendary director Sergei P. Tolstov (late 1940s to mid-1960s). Only some of this work has been published, thus plans, diaries, drawings and photographs (including a large number of pioneering aerial photographs) are a mine of information on past geomorphology and irrigation (first millennium BCE to the Middle Ages), and on landscape and environmental conditions around the mid-twentieth century. Two cooperative digitization projects (Russian–German and Russian–British) have provided an impetus towards cataloguing, but we have still not

covered the entire archive.<sup>3</sup> Our initial aim was to obtain archaeologically useful information from unpublished records about sites in the region, including our own site. But we soon became fascinated by the question of contexts and conditions in which these records had been created. In particular, the archive confirms the hypothesis (suggested by the expedition's publications) that its senior members believed in the Soviet project of shaping the environment for human needs. They therefore contributed willingly and knowingly to the environmental sins of the Soviet regime with their own ideas on how to mitigate the impending disaster of the Aral Sea with the equally problematic 'solution' of reversing the flow of some Siberian rivers. The archaeologists' involvement had two ambivalent outcomes: large quantities of data on past environment and the geomorphological–hydrological structure of the region, as well as the archaeological identification of areas of ancient irrigation which archaeologists and hydrologists suggested should be redeveloped for modern irrigation.

The archive contains a third level of information, namely insights into the individuals who created the records and data (Arzhantseva and Härke 2019). This information is contained in personal diaries, humorous sketches, watercolour paintings and photographs which brought us closer to the people behind the archive, gave us a better understanding of their lives on the expedition and occasionally also of their motives. These personal glimpses reveal a range of personalities – some of them wrote openly and frankly, others were much more guarded and formal. One of the most impressive elements of this archive is the thousands of photographs, mostly from the 1940s to the early 1960s. The director of the expedition was clearly very aware of the power of visual impact and he created his own photographic team headed by charismatic Greek photographer G. A. Argiropulo (not an archaeologist or scientist). Some of the most iconic photographs of archaeological work and life in the desert were clearly carefully arranged. Thus, the archive has its own aesthetic appeal and may be seen as heritage in its own right.

### *Jeanine Dağyeli*

One major aim of the Bukhara project was to generate as much information as possible from indigenous archival sources (in this case predominantly the so-called Qoshbegi Archive from the holdings of the Central State Archive of Uzbekistan) and depend less on other, better explored sources such as colonial documents and travelogues. A second line of enquiry sought to cross-check environmental, especially meteorological information from historical, documentary and narrative sources with meteorological and palaeoclimatological data. While all these sources come with their unique specificities and challenges, the fundamental difficulty for arriving at a synopsis lies, in my opinion, in the fault lines of two different epistemological approaches to temporal, geographical and other sets of scales related to the natural environment.

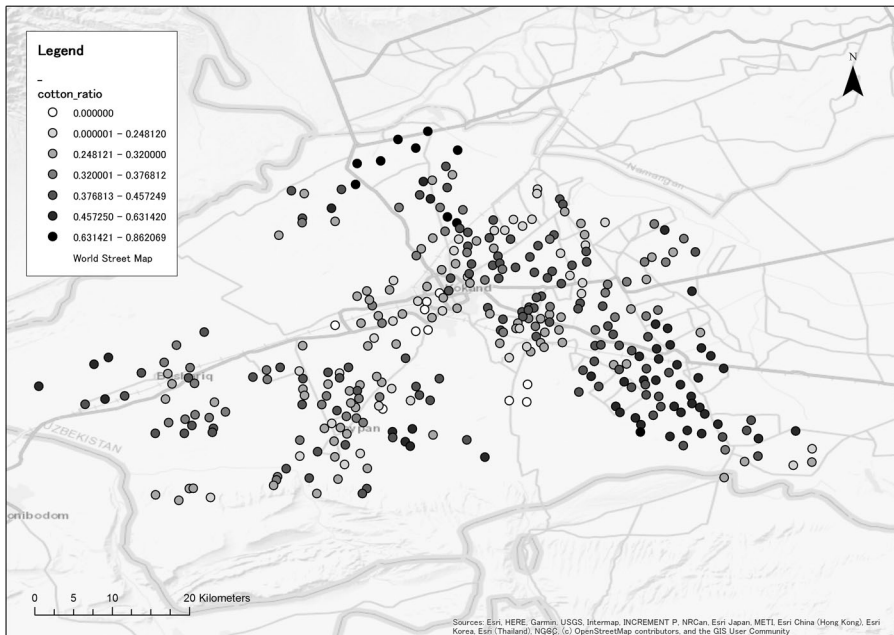
When combining Central Asian historical sources and meteorological data, the difficulties reach a level of fundamental methodological and epistemological questions: first and foremost, how to represent situated, relational data. An important set of sources for human–environment relationships are narrative and administrative texts. While the amount of meteorological information given in administrative sources is often negligible, they may still highlight certain exceptional situations, as an otherwise not recorded instance of a bad vegetable harvest in some of the western districts of Bukhara in the

early twentieth century attests. Narrative sources are usually even more localized, describing circumstances in single villages or for single families in detail but without information about possible wider impacts. How does this information speak to the macro-scale data for the Emirate of Bukhara at the turn of the twentieth century?

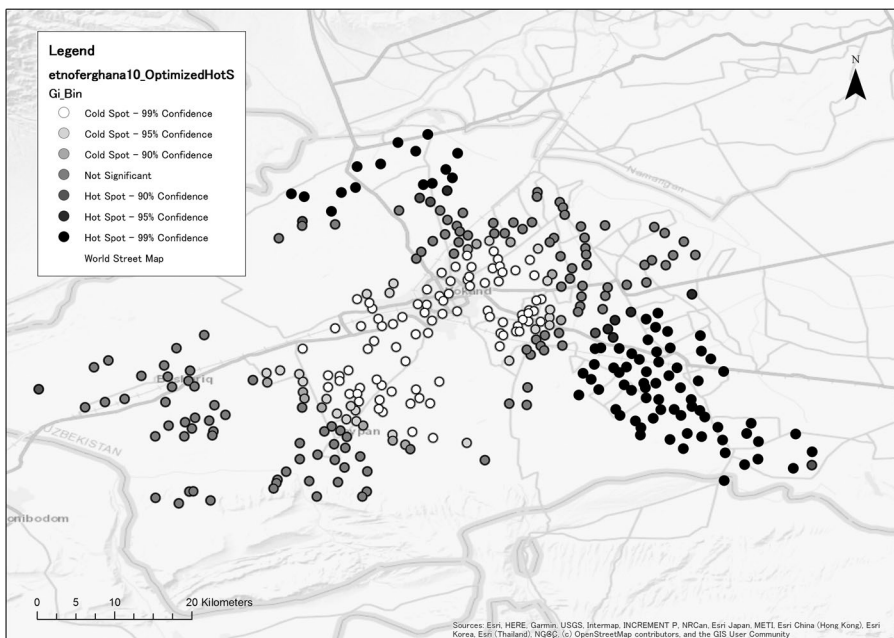
The main data were recorded from weather stations that were spread across Turkestan during the late nineteenth century. None, however, was in the Emirate of Bukhara itself. Meteorological and other scientific data paint a rather dire picture of the late nineteenth-early twentieth centuries and suggests an overall crisis. Droughts followed years of extreme winters, sometimes with black frost. Glaciers receded. Water lines in rivers crucial for irrigation remained critically low. Poor nutrition lowered the resilience of people, plants and animals, and fostered the outbreak of agricultural pests as well as human epidemics. Yet, if we look at how people dealt with challenging environments, there are also a lot of hints at another perspective: a habituation to adverse but recurrent natural phenomena, practices for dealing with meteorological hazards that could be expected in arid environments, and socio-cultural techniques for risk evasion. Anticipation of future crisis was apparently pervasive, especially in rural settings and thus not considered noteworthy in written documentation. A lot of local environmental information comes from rural settings and thus from segments of the population that the literate urban elites did not deem important or that simply escaped their attention. Agricultural techniques such as *khoqkori* – the intensive reworking of the topsoil to grow plants in arid environments that would need irrigation with meltwater only, meticulous inspection of the environment to anticipate drought, heat or frost, or using different zonation for diversifying agricultural and pastoral activities – show a familiarization with the permanent possibility of weather-induced crisis. Micro-scale, localized adaptation techniques such as *khoqkori* reach us predominantly through early ethnographies and oral history.

### **Akira Ueda**

My main sources are the ‘colonial statistics’ compiled by the Russian authorities. While some parts of these have been published, others have been preserved in archives in Russia and the Central Asian republics. In general, ‘colonial statistics’ consist of two components: narrative sources and statistical tables. The authorities periodically published some sources, while others were the results of special expeditions. Although, as Sergei Abashin pointed out (Abashin 2012), colonial statistics of the Russian Empire lack consistency in various respects; they are almost the sole quantitative data source about Central Asian society before the Russian Revolution, which makes them indispensable, among other things, for interdisciplinary environmental studies. I use GIS to exploit these sources. GIS allows us to utilize villages or *aul*-level data to reconstruct the economy of the region. Otherwise, village level-data should be omitted, and they should be summed up to *uezd* or *oblast’* levels, as was done in traditional economic history. Because *uezd* and *oblast’* units match neither the territories of historical oases nor the local environment, traditional studies fail to transcend the Russian colonial administrative boundaries, whilst village-level analysis shows the relationship between human activity and the natural environment. GIS is suited to show patterns in big data and evaluate the statistical significances of spatial tendencies. For example, GIS software can find spatial ‘hot spots’ of cotton planting from the hundreds of village data sources (Figures 1 and 2).



**Figure 1.** Raw data for the cotton ratio in the Kokand oasis c.1900. Source: Nazarov (1912). copyright: Akira Ueda.



**Figure 2.** 'Hot spots' and 'cold spots' calculated by ArcGIS. Source: Nazarov (1912) copyright: Akira Ueda.

GIS alone, though, cannot reveal causation in the tendencies seen in the statistical data, for which I use narrative sources. From another viewpoint, quantitative and qualitative limitations in the historical statistics prevent me from resorting to the more precise statistical methods used by economists.

### Scale: discussion

Like a body of sources, scales of analysis are a product of past and present human decisions – including those of the individual researcher and their disciplinary training. We asked contributors to reflect critically on the scale(s) used in their work: What temporal, institutional and spatial scales do these sources speak about? What is the effect of ‘copying’ our sources’ spatial and temporal frame of reference (e.g., conventional units of an *oblast*, nation-state, the Bronze Age, a five-year plan, Kazakhstan’s 2060 development plan or the Islamic calendar)? Where is the influence of ideology, institutions, epistemic communities or geopolitics visible in scaling effects (e.g., in the definition of ‘Central Asia’)? How do we deal with contradictory evidence between different scales or types of sources? We collectively reflect here on scaling traditions in different disciplines and the ways sources impose different scales. How might we take evidence pitched at one scale (e.g., an ethnographic village study) and ‘scale it up’, and vice versa? Would another scale lead to partially different or more nuanced conclusions?

### Amanda Wooden

Research about ecological issues and multiple actants including human and non-humans (Latour 2004) is necessarily multi-source and multi-scalar. For these reasons, my greatest difficulty is the multiple moving parts: interpreting what is happening across these scales within the context of dynamic culture and politics. My research interest is how everyday experiences and emotional reactions translate into mass politics, focusing on the meeting points between scales from individuals and local community groups to transboundary glaciers and politics seemingly bounded by national institutions. The nation-state scale is prominent in my research because I am interested in the formalization and codification of narratives into policies. However, in studying extractivism, it is crucial to understand the operation of global political economies, of how transnational economic groups – such as mining companies, international mining transparency organizations and sustainability certifiers – operate and interact much more fluidly than other actors across these boundaries and within ecosystems and communities. It is quite fascinating how mining politics in Kyrgyzstan replicates (and shapes!) mining elsewhere on the rhetorical as well as physical, economic–technical and political levels, and the ways actors with less political power – such as environmental activists – have also moved across these scales to effectively challenge global actors.

### Eva-Marie Dubuisson

The question of environmental protection in Kazakhstan brings into relief the relationship between local and national governance, the legacy of Soviet science and policy in contemporary discussions, and the idea of spiritual and natural life-worlds that extend far

beyond the limits of any state border or period. I speculate that mobilization around issues of environmental affairs as well as land and resource management are successful precisely because a wide variety of actors and groups can relate to the idea of protection in different ways. Herein lie two key questions: What is the *object* of protection: for example, bio-species diversity? Physical geography? Archaeological and sacred sites? National parks lands? Resources for citizens? National sovereignty? Who is positioned as an *agent* of protection? In ongoing and recent protests over these issues, it is clear that an increasing number of people, working in different specific contexts, are sending a relatively unified message to their leaders: follow established laws and the best interests of our citizens, rather than capitalizing upon short-term economic advantages (Dubuisson 2020).

The project seeks to bridge scalar limitations, to understand, for example, discourses as emerging from social histories, enabling present forms of mobilization, and constituting future imaginaries. Similarly, it is clear in discussions of land and resource management in Kazakhstan, that the levels of local/regional, national, and international governance and frameworks of protection are always overlapping and in conversation with one another. Indeed, the very legacy of Soviet national parks protection was developed in conjunction with the United Nations framework many decades ago: these are not correctly viewed as ‘separate’ models.

### *Jeanine Dağyeli*

Scales may radically shape very different visions of an adequate, if not ideal, environment and the dealings with it: whether, for example, a terrain should be used as pasture, field, building site or not at all. Most of us are familiar with what we assume to be a standard, universal model of measuring temperature, barometric pressure, water levels, rates of infection, etc. Indigenous assessments from nineteenth- and early twentieth-centuries Central Asia relied to a high degree on relational, embodied, situated and continuously negotiated systems of environmental knowledge generation. Solar altitudes in relation to a mountain peak, water levels in relation to a human or animal body, and relations of different parts of the human body were used to determine seeding times, water volume allocation or fall of ground in specific locations. Which scales do we thus apply for representing the valuation or devaluation of certain dimensions of the landscape, global, national, local, individual? Agricultural, pastoralist and mixed-economy access to suitable land and water resources were vital for the livelihoods of a majority of Central Asians, yet the post-conquest Russian administration never properly understood arrangements and details for the use of these resources (Morrison 2008, 207–208). One of their main problems remained the relational character of environmental knowledge, or, as major General Aleksandr Abramov complained with regard to Central Asian water experts, ‘what is meant by “lots of” water or “a little” water or “an average amount” of water’ was not clear (cited in Morrison 2008, 208). Abramov was not alone in his judgement about the ‘elusiveness’ of indigenous measurements: the regional and relational variations of units of weight, length and volume are well known (and can plague the historian if the place they refer to remains opaque). This makes the exploration of indigenous environmental knowledge even more important for our understanding. Locations matter: crop failure of irrigated grain in the oasis of Bukhara in 1860 suggests a drought year, for



example, and an overall harvest failure. The same year had, however, seen enough rain during winter and spring in the same oasis to make the harvest of rain-fed wheat from piedmonts satisfactory (Sobolev 1874, 107). Therefore, a farmer engaged in rain-fed agriculture only a short distance from the irrigated fields that suffered failure but in a different (piedmont) zonation would thus have judged the weather and the agricultural season much more favourably.

### *Irina Arzhantseva and Heinrich Härke*

Our two types of sources work mostly (but not exclusively) on different scales. The archival sources we use frame our thinking on three broad chronological horizons: first, the prehistoric and early historical past which was, with all its environmental aspects, explored by the Khorezmian Expedition; second, the Soviet period, as both the intellectual and organizational context of the expedition, and also the period of the greatest Central Asian environmental disasters; and third, our own present, in which we study these earlier horizons, but with different questions and approaches. Lacking textual sources for much of the ‘deep’ archaeological past, we study its environment largely phenomenologically, that is, mostly without asking about the actors’ motivations. When dealing with the Soviet historical horizon, its political circumstances require a critical assessment of the motivations of state actors as well as those of the archaeologists who chose to collaborate with the system, legitimizing plans for large-scale environmental engineering by reference to prehistoric and early historical irrigation systems (Arzhantseva 2015). In our own present, we direct our critical enquiries back towards the past, but so far not towards our own actions and motivations. Self-reflexive critique (Hodder 2000; Londoño 2014) has not been much used in the post-Soviet archaeology of Central Asia so far. The archaeological evidence for past environments is perhaps too obviously chronologically located to invite critical reflection about time scales, but we found that reflection about spatial scales is needed in order to make sense of such evidence. Our key site of Dzankent is an abandoned town, a settlement that in its heyday may have been home to some 1000–2000 people. It is located in the delta of the Syr-darya close to the eastern shore of the Aral Sea, a once literally fluid and changeable environment where shifts of river channels provided new opportunities, but also destroyed the livelihood of entire regional populations (such as the Dzhety-asar Culture which ended in the seventh century CE without a direct successor). This delta, in turn, is wedged between the northern steppes and the deserts of Central Asia, with oasis civilizations (such as Khorezm) whose livelihood and well-being depended on the snowfall and thaws on the faraway Tian Shan Mountains. The origin and end of our site might have also depended on nomadic movements, Islamic expansion and changing trade patterns, but its flourishing surely coincided with a transgression phase of the Aral Sea. Its shores were a mere 30 km or so away from the site, thus facilitating river transport. The growing awareness of these geographical scales led to our new understanding and interpretation of the early medieval towns in the Syr-Darya delta.

### *Akira Ueda*

I have used three spatial scales so far: the historical oasis, the Russian imperial *oblast’* and the present national republics. Because colonial sources were based on the *oblast’* system,

village-level data helped in the processing of information in the sources to fit the oasis and the present borders. The timespan of my research includes the 1924 radical change in administrative structure. To compare data before and after 1924, GIS helps us reconstruct the new administrative units out of old minor units such as *volost'* or village. Of course, to identify continuities and rupture between the revolution and delimitation, one needs to muster all available sources. Similarly, one needs to play on different scales to investigate the local economy and environment, as the study of the weekly bazaar cycle recorded in an early Soviet survey shows. In this case, the scale between that of oasis and *oblast'* is essential: although the role of long-distance trade in oases' economies is undeniable, the area connected through the bazaar cycle was in all likelihood the most relevant economic space for the local population.

### Towards new research areas and skills

In this roundtable, a wide, but not exhaustive, range of environmental issues in Central Asia has come into view: agricultural livelihoods and crises, irrigation water management, climate change at different scales, desertification and the shrinking Aral Sea, mining controversies and a range of contemporary environmental policies and forms of activism. To include the non-human world in our analyses of Central Asia requires self-consciously operating across scales in space (e.g., from the geographical spread of pests across a region to the cultural practices attached to them in a village) and time (e.g., from climate change in the *longue durée*, to contemporary management of common-pool resources). For example, Dubuisson discusses how in contemporary Kazakhstan the scale of an ecozone (the steppe) is treated as a valued 'place' associated with a particular human way of living. A self-conscious consideration of sources and scales prompts the question of comparability: What happens if we pluralize standard units of analysis, or work to connect up scales and sources (Deville, Guggenheim, and Hrdličková 2016; Herzfeld 2001)?

Furthermore, in the light of the interpretive challenges of sources and multilayered knowledge on the environment required, what kind of interdisciplinarity should one aspire to? A first divide to be crossed is that between quantitative and qualitative approaches. This is reflected in Wooden's experience and in her decision to move from political science-style quantitative analysis on a cross-national scale to interviews, and then ultimately to participant-led conversations. In history, Ueda's awareness of the need to stitch together statistical data and their accompanying narrative materials goes in the same direction. More radically, Dağyeli combines data collected by past natural scientists (and still used now) and micro-level vernacular sources. Archaeologists such as Härke and Arzhantseva already operate in a field where this flexibility is common practice. At a minimum, crossing the quantitative versus qualitative divide requires a degree of familiarity with both – and respect for the methods of others. Political scientists and archaeologists have a head start in this, whilst historians and anthropologists of Central Asia have seemed more reluctant. At the same time, historians are better placed to understand the power relations and cultural constraints that underpin the formation of quantitative *corpora*. Central Asian studies, or indeed the environmental humanities, are not the only fields where greater literacy in reading outside one's discipline is being advocated, parallel to strong attention to source criticism (Nafziger 2017).

A second, more challenging step toward interdisciplinarity, only partly addressed in this forum, is the need to incorporate the *non-human* world in the environmental humanities field. Even before trying to capture the ‘voice’ or the agency of non-humans, as recently done for Tashkent’s trees (Olma 2018), one needs to consider the latter as more than just background features. To pursue what McNeill (2003) called ‘material environmental history’, a degree of openness to geology, zoology, botany and other relevant fields is paramount. Alternative formats for the production and dissemination of knowledge on environments can also come from studies in social anthropology, folklore, Central Asian arts or linguistics that tap into more embodied and vernacular ways of understanding Central Asia. Relatedly, it should be noted there is a significant divide that cross-cuts disciplines between scholarship with a positivist interest in environmental ‘facts’ and scholarship that has a heightened, self-critical interest in the politics of knowledge production, including unequal divisions of labour and rewards among Central Asianists working in different languages and at different institutions (cf. Amsler 2007). These differing interests, research ethics and practical opportunities have often proved a major obstacle in cooperation. They have sometimes led, for instance, to the purely tokenistic involvement of humanities or social researchers in natural science projects. In addition, environmental policy and activism in Central Asia have a complicated relationship with sponsorship and ideas from beyond the region, which makes it imperative to constantly interrogate the motives of both scholars and other stakeholders. In consequence, the articulation of work on Central Asian human–environment relations *as* environmental humanities research should provoke a vigorous debate – and the generation of vibrant alternatives to this very option. To help start such a conversation, we asked our authors to comment on potential future trajectories for (as well as *into* or *out of*) environmental humanities research on Central Asia. What kind of methodologies, concepts or institution-building activities could help our understanding of human–environment relations?

### **Akira Ueda**

I believe that GIS has great potential as a platform for interdisciplinary studies. Researchers in the humanities have access to many forms of spatial information. When big data drawn from various disciplines are integrated into a single platform or allocated common spatial codes, humanities researchers are able to correlate various types of information gathered through research in non-humanities fields. Similarly, researchers in non-humanities fields can use spatial codes to translate humanities-derived data for use in their own contexts. For example, they may use humanities-derived data as dummy variables. For this reason, a GIS platform for interdisciplinary area studies would indeed allow researchers to use data beyond their original research intention.

GIS or spatial sciences can be a lingua franca among all disciplines related to regions. In my opinion, researchers in humanities usually use the result of geology, zoology, botany etc. without GIS but natural scientists rarely utilize the result of humanities in their academic work. These one-side passages of academic knowledge may give natural sciences a general and universal appearance. For that reason, the ‘translation’ of humanities and social research for natural and applied researchers is very important.

### *Eva-Marie Dubuisson*

In Kazakhstan at many societal levels one observes a widespread concern for environmental issues and for the protection of natural spaces, and a wish to safeguard resources for the country's future. Government and non-governmental agents conduct a great deal of research on environmental issues at the national and local levels. All the project participants – national parks managers, legal and human rights practitioners, scientists, teachers and local community activists – agreed that increasing general education and awareness about the actual issues facing the country and its regions would result in better commitment and action, such as participation in environmental decision-making, or promoting both citizen and government accountability – principles which recall Aarhus goals. However, because the realm of 'ecology' is contentious and many consider it overly 'political', respondents tended to avoid this category altogether and focused on different terms or more specific issues, such as legal cases or distinct instances of pollution. The participants' fear of political recrimination, as well as the Soviet-style historical separation of issues and specialisms, explains the on-ground reluctance to identify interrelated issues under one uniting umbrella. Because of this tendency to 'parcel out' environmental topics, in Kazakhstan the need to integrate various fields and levels of research is not only to be seen in models of academic research on environmental topics, for instance, through the simultaneous analysis of quantitative and qualitative data, but also – at a wider and more basic level – in the way society at large generates, processes and shares information.

### *Jeanine Dağyeli*

Exploring the environmental aspects of Central Asian history and presence has the potential of opening the discussion and speaking beyond our regional interest. This would be very desirable. Central Asia is still in many social science and humanities fields the 'exotic' outsider, a supplementary to discussions held elsewhere (maybe with the exception of archaeology). This is not necessarily true for the natural sciences, possibly because international collaboration was and is conceived as less threatening to national meta-narratives by governments such as the Soviet, Chinese and Central Asian regimes. One challenge in trying to draw a more holistic picture of the environments' rural inhabitants of different locations in Central Asia is that this kind of enterprise calls for collaboration across disciplines. The limitations of a training in one or even two disciplines become obvious once we deal with environments in the widest sense. Collaborating with an entomologist, for example, would have been extremely valuable and reassuring in an earlier publication of mine on agricultural pests (Dağyeli 2020), as would be collaboration with biologists, geographers and other colleagues. This is not just to better understand the scientific data and judge their value and limitations, but also to situate information derived from narrative-based historical sources. For example, which plants are susceptible to mildew under which conditions in Central Asian climate? A note about a plantation that succumbed to mildew would then allow conclusions about the weather in a given year and specific locality. While proclamations of collaboration usually enjoy broad endorsement, its practical implications are much more intricate (Di Cosmo 2014, 2018; Eklund and Lange 2018). Interdisciplinary collaboration requires openness in many respects, at

the same time it is crucial to be clear about which results are to be gained by applying which scales. Long-term, macro-scale changes of climate, riverbeds and vegetation cover are important indicators of transitions, but they need to be scaled down to concrete locations and communities to remain meaningful for social history/historical anthropology disciplines, while we need to be cautious not to neglect political, cultural and other factors through our fascination with the environment (Paul 2016).

### *Amanda Wooden*

Scholarship about socio-environments in Central Asia that moves us into more critical and radical theoretical conversations – and outside of dominant linguistic, conceptual and theoretical ideas – would be most welcome. Some scholars bring decolonial, feminist, post-human, queer, and critical race studies into Central Asian environmental humanities to great benefit (e.g., Behzadi and Direnberger 2020; Kesküla 2018; Suyarkulova 2014). In particular, challenging the conceptualizations of environment–human relations as bounded by nations or municipalities, analyzing human relations at ecosystem scales and bioregions, and centring Indigenous worldviews would be particularly useful scholarly trajectories in an area studies stuck on human centring, within country analysis, colonial methodologies, and the Russian empire/Soviet and Soviet/post-Soviet binaries. The study of environment–human relations fundamentally *requires* multi- and transdisciplinary methodologies. Often environmental humanists and humanistic social scientists read and speak to natural science literature without identifying this interdisciplinarity aspect of their work. For example, I tend to explain my work first as informed by humanistic and artistic disciplines, though it is fundamentally shaped by – and seeks to interpret in social context – geological sciences and engineering. Thinking in systemic terms about ecological, health, and industrial issues easily leads to such boundary-breaking, as the study of ‘beyond human’ relations reveals a need to remake scholarship. Explicitly partnering with transdisciplinary physical scientists is a valuable aspect of strengthened Environmental Humanities. Multidisciplinary research teams, working across research scales, are logical, as Dağyeli describes, for achieving more holistic understandings of environmental issues; furthermore, as Dubuisson notes, this is also needed among and in support of practitioners and activists in Kazakhstan. The methods and composition of these teams can be decolonizing: they challenge individualistic research, can promote centring of Central Asian scholars, and generate more broadly applicable research for and with communities. Finally, environmental humanities work that brings into view and voice the kinds of futures various people in Central Asia are discussing, imagining, and working to create, would be a practical, visionary and important application easily within the purview of this field.

### *Irina Arzhantseva and Heinrich Härke*

Seeing that we are the only archaeologists in this round table, it makes sense for us to focus on our discipline, and on what it can contribute. Interdisciplinarity is, indeed, our primary challenge, but we are not so much concerned with overcoming, for example, the divide between quantitative and qualitative approaches. In Central Asian archaeology, our challenge is rather to establish true interdisciplinarity in the first place. The geoarchaeological approach we have adopted at Dzhanakent is innovative for the region, and we

hope that it can become a model for the next generation of ‘home-grown’ archaeologists, including those involved in our projects. Interdisciplinarity is also the key for our discipline to approach human–environment relations. An example from our own work concerns human–animal relations: excavations at Dzhanakent have unearthed the remains of the earliest domesticated cat ever found on the Northern Silk Road. Ashley Haruda, a zooarchaeologist on the project, identified the bones and got a team together to study the palaeopathology, stable isotopes, ancient DNA and radiocarbon date of the animal. We thus know that this was a tomcat of true domesticated stock that had been fed well, probably with fish, and had been cared for after a disabling injury (Haruda et al. 2020). This has implications for human–animal relations and for the nature of the site of Dzhanakent at the end of the eighth century CE. Cats are not part of the nomad stock of animals, so this find confirms that there must have been non-nomadic elements in the population of Dzhanakent. Furthermore, cats are urban animals, so the settlement of Dzhanakent may have been of an urban type a full century earlier than we had hitherto assumed. Just digging holes in the ground would not have given us any of these insights.

## Notes

1. As a broad-brush term that has focused public attention, the ‘Anthropocene’ is also widely critiqued as a depoliticizing term that obfuscates the unequal participation of different human groups in causing and suffering the harmful effects of ‘our’ Anthropocene (e.g., Hayman, James, and Wedge 2018; Malm and Hornborg 2014). Alternative concepts such as ‘Capitalocene’ (Moore 2016) or ‘Chthulucene’ (Haraway 2015) encourage a repoliticization and argue against seeing solutions as primarily techno-scientific (Blaser 2019).
2. See <https://uni-tuebingen.de/de/199,591>.
3. See [https://www.gerda-henkel-stiftung.de/conserving-cataloguing-and-digitizing-the-archive-of-the-soviet-chorasmian-expedition?page\\_id=79991](https://www.gerda-henkel-stiftung.de/conserving-cataloguing-and-digitizing-the-archive-of-the-soviet-chorasmian-expedition?page_id=79991).

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