The Archaeology of Asia-Pacific Navigation 6

Jim Cassidy · Irina Ponkratova · Ben Fitzhugh *Editors*

Maritime Prehistory of Northeast Asia

With a Foreword by
Dr. William W. Fitzhugh

Springer

The Archaeology of Asia-Pacific Navigation

Volume 6

This series will publish the most important, current archaeological research on ancient navigation and sea routes in the Asia-Pacific region, which were key, dynamic factors in the development of human civilizations spanning the last several thousand years. Restoring an international and multidisciplinary academic dialogue through cross cultural perspectives, these publications underscore the significance of diverse lines of evidence, including sea routes, ship cargo, shipwreck, seaports landscape, maritime heritage, nautical technology and the role of indigenous peoples. They explore a broad range of outstanding work to highlight various aspects of the historical Four Oceans sailing routes in Asia-Pacific navigation, as well as their prehistoric antecedents, offering a challenging but highly distinctive contribution to a better understanding of global maritime history.

The series is intended for scholars and students in the fields of archaeology, history, anthropology, ethnology, economics, sociology, and political science, as well as nautical technicians and oceanic scientists who are interested in the prehistoric and historical seascape and marine livelihood, navigation and nautical techniques, the maritime silk road and overseas trade, maritime cultural dissemination and oceanic immigration in eastern and southeastern Asia and the Pacific region.

The Archaeology of Asia-Pacific Navigation book series is published in conjunction with Springer under the auspices of the Center for Maritime Archaeology of Xiamen University (CMAXMU) in China. The first series editor is Dr. Chunming Wu, who is a chief researcher and was a Professor at the institute. The advisory and editorial committee consists of more than 20 distinguished scholars and leaders in the field of maritime archaeology of the Asia-Pacific region.

More information about this series at https://link.springer.com/bookseries/16203

Jim Cassidy · Irina Ponkratova · Ben Fitzhugh
Editors

Maritime Prehistory of Northeast Asia

With a Foreword by Dr. William W. Fitzhugh

Springer

Editors
Jim Cassidy
Maritime Museum of San Diego
San Diego, CA, USA

Irina Ponkratova
Northeastern State University
Magadan, Russia

Ben Fitzhugh
Department of Anthropology
University of Washington
Seattle, WA, USA

ISSN 2524-7468 ISSN 2524-7476 (electronic)
The Archaeology of Asia-Pacific Navigation
ISBN 978-981-19-1117-0 ISBN 978-981-19-1118-7 (eBook)
https://doi.org/10.1007/978-981-19-1118-7

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Foreword: Northeast Asia Prehistory "In the Twinkling of an Eye"

The Maritime Prehistory of Northeast Asia is a major milestone in the jigsaw puzzle of world prehistory. The Northwest Pacific is, archaeologically, one of the least known areas of the world. Its geographic location at the gateway from the Old World to America and the long-standing cultural and genetic connections makes it crucial for understanding the development of boats and seafaring, northern maritime adaptations, the initial peopling of the Americas, subsequent trans-Beringian/Pacific migrations and exchanges, and the search for Eskimo origins. Besides "hot-spots" like Japan and the Bering Strait region where archaeology has been conducted for more than a century, knowledge of the rest of Northeast Asia has been slow to accumulate. An archaeological equivalent of Guillaume Deslisle's 1714 map of the northern hemisphere (showing the entire North Pacific as a huge void; Fitzhugh and Crowell 1988:8) would not be quite so empty; but until the present volume, knowledge was anchored on land at the extreme ends of its 3500-mile coast. What lay between was illuminated only by a few scattered sites, some—like Ushki—of great, but isolated, importance.

The *MPNA* begins to redress the terrestrial bias that has obscured the maritime history of Far East and Northeast Asian prehistory. Apart from its contributions to culture history, this volume provides a template for investigating, together with earth and social sciences, humanity's little-known "other world"—the marine ecological realm that has been as important a venue for humans as the better-known terrestrial world.

Investigation of early maritime societies is a relatively recent archaeological endeavour (Fitzhugh 1975; McCartney 1975; Stark et al. 1978; Yesner 1980; Bailey and Parkington 1988; Sanger 1988; Sandweiss et al. 1998; Erlandson and Fitzpatrick 2006; Rick 2008; Braje and Rick 2011; Reeder-Myers et al . 2019). Use of coastal resources began when Palaeolithic ancestors populated lakes, rivers, and estuaries. Global sea level rise has hidden or destroyed most coastal sites, leaving only those from northern regions where post-glacial isostacy preserved ancient shorelines. Some northern regions like Scandinavia's Varanger Fjord have 10,000 years of prehistory stacked up on its raised beaches and terraces, often accompanied by rock art illustrating people hunting whales and seals in large boats. Farther south, the inundated coast of Denmark has underwater sites with large 6000-year-old detachable bone and antler harpoons, and in northeastern North America, 4000 BP Maritime Archaic sites in the Gulf of Maine yield harpoons, engraved slate lances and daggers made of swordfish bills, and in Newfoundland, sculptures of killer whales. Such finds pale when compared to fish harpoons from 90,000 years ago in the African Middle Stone Age Katanga site (Yellen et al. 1995), and there are claims of tuna fishing at Jerimilai Shelter in East Timor at 42,000 BP, where large shell (ritual?) fishhooks date 16-28,000 BP (Langley et al. 2016). Humans reached Australia by boat or raft more than 60,000 years ago, while others acquired obsidian from Kozu Island 28–32 km off the paleo-Honshu coast at 42,000 BP. Such evidence dispels the commonly expressed doubt, exemplified by the reaction to the Solutrean hypothesis (Stanford and Bradley 2012), that humans lacked the technology for sea-going voyaging during the Upper Paleolithic.

Long before ground stone tools herald the appearance of dugouts in northern Scandinavia, peoples in northern Eurasia were making bark or skin boats (Luukkanen and Fitzhugh 2020). Boats made from the sturdy bark of tropical trees or from elm in temperate zones, such as those crafted by the Ainu, or from animal hide north of the tree line, must have been used at least since the Upper Paleolithic (ca. 50,000–12,000 B.P.). Paleolithic paintings and carvings of fish and seals and engravings on bone provide tangible evidence; but physical objects are no longer the only indicators of seafaring or maritime activity. Facing the scarcity of boats and boat images in the archaeological record, authors of these papers use other methods for exploring connections. Chemical sourcing of pigments, obsidian, and other lithics track raw material movements across land and sea, and DNA signatures identify human, animal, and plant connections even when their corporal remains no longer survive.

Impediments to Knowledge

The reasons for the maritime archaeological void are many, and some have to do with politics and institutional history. Russian lands north of Japan and Korea, governed from 8000 miles away in Moscow and St. Petersburg, were institutionally undeveloped, inhibiting archaeological investigations. Local indigenous peoples relied on oral historical and non-Western methods for exploring the past. Heritage is always a local matter. Academic centres in Vladivostok, Khabarovsk, Petropavlovsk, and Magadan had few researchers, funds, or students trained in archaeology. Moreover, during the Soviet era, except for a priority on Chukotka, emphasis was centred on investigating agricultural and state development in southern and western Russia, and language barriers and limited distribution of publications restricted information flow between Russia, Japan, Korea, China, and North America. The flood of investigations and state-supported archaeological recovery programmes that in recent decades produced rich rewards in Japan and Korea were not available in the Soviet Far East or coastal northeastern China. Today the situation has changed, and international collaborations have produced much of the knowledge reported in this volume.

However, Mother Nature bears responsibility for limiting the archaeological resource base. Northeast Asia is one of the most active tectonic regions on the planet and is subject to large earthquakes and tidal waves. In addition to shoreline upheaval, erosion, and subsidence, vulcanism has rained ash down on settlements and animals, buried villages, extinguished populations, and forced human and animal movements. But the greatest impact, especially on the most ancient sites, has been post-glacial isostatic sea level rise that inundated or washed away coastal and lower riverine settlements. These hazards have fallen disproportionally upon maritime prehistory because of the shoreside location of settlements, and for those that escaped inundation or destruction, acid forest soils winnowed the record by removing organic materials. Still, as we discover here, archaeologists have been clever at out-foxing Nature by deciphering ecological and human history from DNA and isotope signals in soil and bone.

A Selective Research History

During the past hundred years, archaeologists have approached Northeast Asia prehistory from various directions and perspectives. The Jesup North Pacific Expedition (1897–1903) sought to decipher Beringian connections by gathering ethnographic, linguistic, mythological, and historical information, thereby preserving information that laid the groundwork for all future anthropological studies. While this landmark project was the first attempt at a North Pacific synthesis, it failed to produce the promised cross-cultural synthesis and never was able to gather archaeological evidence in Asia (Fitzhugh and Crowell 1988; Krupnik and Fitzhugh 2001; Fitzhugh and Chaussonnet 1994; Kendall and Krupnik 2003). Less than ten years after the JNPE, Waldemar Jochelson conducted excavations in Kamchatka as part of the Ryaboushinsky Expedition in 1910–1911 and pursued archaeological and ethnological work in the Aleutians (1925, 1928, 1933). Forty years later, with the rudiments of archaeological analysis established, Leroi-Gourhan (1946) produced an archaeological synthesis based on museum collections that revealed widespread similarities in prehistoric harpoon technology. Hoping to establish migration history, he ended up urging caution in using material culture comparisons in the absence of human skeletal evidence. Frederica deLaguna's book review included a comment that is as relevant today as in 1949:

> Culture historians obviously have different temperamental bents, and fortunately so. Yet while sober caution must be valued, let us realize that always to keep within the bounds of the surely provable, always to cling to the safety of the indisputable, never to run the risk of error, is to renounce the hope of gaining that insight which may perhaps be won only through the hazards of imaginative speculation. (deLaguna 1949:647)

Thirty-six years later, Chester Chard's *Northeast Asia in Prehistory* (1975) produced the first archaeological synthesis based on excavated data and collections. Chard had the advantage of Russian language and a 1950–1960s burst of Russian work between the Amur and Bering Strait by Okladnikov, Rudenko, Debetz, Dikov, Sergeev, Arutiunov, Alekseev, and others. Nothing of these authors' works would have been known outside of Russia were it not for the Arctic Institute of North America's *Translations from Russian Sources* edited by Henry Michael and the new American journal *Arctic Anthropology* established by Chard at the University of Wisconsin. Even so, lack of data south of Chukotka required Chard to emphasize developments outside Northeast Asia as the *deus ex machina.*

Early Exchanges

Ever since Jochelson's work in Kamchatka and the Aleutians and Henry Collins' on St. Lawrence Island (1937, 1940), deLaguna and Collins saw northeast Siberia and the Russian Far East as the source of diffusion and population movements into western Alaska. Collins identified slat armour used by Punuk and later warriors in Bering Strait Northwest Coast regions as part of an Asian warfare complex, and deLaguna (1946) suggested the Kamchatka sadiron lamp as the source of Aleut lamps (deLaguna 1946). Carl Schuster (1951; Schuster and Carpenter 1996) wrote about the survival of Scythian elements in Yup'ik and Inuit art; and Collins (1971) pointed to Chinese prototypes for Ipiutak death masks. These and other finds kept interest in Beringian connections alive through the Cold War era. The first attempt to break the "ice curtain" came from scientific diplomacy by William S. Laughlin who staged a Russian visit to Laughlin's Anangula site in the Aleutian Islands in 1974. Among the Russian delegation headed by A. P. Okladnikov were A. K. Konopatskii, A. P. Derevianko, R. S. Vasil'evskii, and V. E. Larichev (Campbell 1976; Laughlin 2002). Americans like Laughlin, John Campbell, Don Dumond, Robert Ackerman, and Douglas Anderson hoped for a reciprocal visit to Siberia, but the plan was scotched by Soviet bureaucrats.

To establish American research exchanges with the USSR and Soviet bloc countries, the U.S. Department of State and other institutions in 1968 established the International Research and Exchanges Board (IREX). After 1974, Americans continued to press for reciprocity and access to Siberian sites and scholars, but all proposals were denied because of the military sensitivity of Chukotka. However, in the late 1970s, an opportunity arose for the Smithsonian to organize a joint exhibition with the USSR Academy of Sciences' Institute of Ethnography and its Kunstkamera (Peter the Great Museum) in St. Petersburg. In 1988, after a decade of negotiations and museum research exchanges, *Crossroads of Continents: Cultures of Siberia and Alaska* opened at the Smithsonian.

Crossroads drew together many threads of earlier North Pacific anthropological studies and initiated a wave of post-glasnost Russian–American collaboration including conferences and publications (Fitzhugh and Crowell 1988; Fitzhugh and Chaussonnet 1994; Krupnik and Fitzhugh 2001; Kendall and Krupnik 2003). Although the large Crossroads exhibit toured widely in North America, accompanied by Russian scholars, the collapse of the U.S.S.R. in 1991 made it too risky for a large American exhibition to tour in Russia. Instead, the Smithsonian's newly created Arctic Studies Center, created a "mini-Crossroads" exhibit—*Crossroads Siberia/Alaska*—that toured in Alaska (Chaussonnet 1995) and the Russian Far East (Chaussonnet and Krupnik 1996), spreading knowledge about Siberia–Alaska connections. Mini-Crossroads utilized small objects from Smithsonian and local Siberian collections and established contacts between a new generation of local North Pacific scholars. Other than Chukotka Old Bering Sea materials and objects from Ukhski and Sakhalin sites, archaeology had a minor role in these dominantly historical and ethnographic exhibits and publications.

Crossroads addressed two of the most fundamental issues in North American culture history: the history and relationship between Siberian and Alaskan peoples and cultures and their connections across Bering Strait over time. Eskimo culture had become a particular interest following Martin Frobisher's speculations about the Asian features of Baffin Inuit in 1576. The topic had been skirted by the Jesup expedition (Dumond 2003) but became the focus of the Danish Fifth Thule Expedition of 1921–1924 (Krupnik 2018; Krupnik et al. 2021). An interim resolution establishing in situ development for the past 2,000 years was achieved by Collins' (1937) at Bering Strait in the 1920–1930s, but its earlier origins remained unknown. His St. Lawrence Island work and Helge Larsen's and Froelich Rainey's at Ipiutak (1948) revealed the first specific ancient Alaskan connections with northeastern Siberia and provided data for Collins' (1971) ideas about Chou dynasty death masks and Carl Schuster's (1951) speculations about links with Iron Age Scythian animal style art (Fitzhugh 1988). These finds were amplified by excavations begun by Maxim Levin and completed by his students, Sergei Arutiunov and Dorian Sergeev at Old Bering Sea cemeteries at Uelen (1969) and Ekven (1975). With the "ice curtain" finally broken by 1990, collaborations soon brought Americans, Europeans, and Russian archaeologists into Russian Arctic regions and between the Bering Strait and Sea of Okhotsk. While High Arctic studies did not support theories of Russian Arctic Eskimo origins or provide even hints of early maritime development (Fitzhugh 1998, 2009; Pitulko 1993), they focused attention on the Northwest Pacific coast, Kuriles, and Amur region where Chard and Russians supposed proto-Eskimo cultures might be found (Derevianko and Medvedev 2006; B. Fitzhugh et al. 2016). At the same time, post-glasnost policies brought wider contacts between Russian, Canadian, and American archaeologists and paleoenvironment scientists represented in this volume. Meanwhile, American and Canadian collaborations with Japanese (Serizawa and Hurley 1978; Ikawa-Smith 2009; Habu 2004) helped bring Japan's culture history to Western readers.

Besides Japan and the Bering Sea, Northeast China and Korea have important maritime stories that have not been reported in Western or Russian literature or only recently have seen international collaborations. Once again, language barriers and national agendas prioritizing of state and empire development have restricted coastal archaeology. Nevertheless, recent studies of whaling and early rock art show the promise of Korea's vast archipelago coast, and we may expect similar prospects in northern China.

After-Thoughts for the Future

With apologies for my northern perspective, I offer a few closing thoughts. This volume shows the promise of Northeast Asian contributions to maritime adaptations and their role in human history. Northeast Asia's complex geography, dynamic earth processes, and deep human history provide an unparalleled tableau for studies of humans and the sea. Archaeology along the west coast of North America, which humans have occupied for only 15–20 ka has produced volumes of marine anthropology in just a few decades. Such studies are still in their infancy in Eastern Asia, but with this volume, we can imagine the rewards to come from a region with a much deeper human history and greater environmental and cultural diversity, close to centres of Southeast Asian and Chinese innovation. The western Pacific coast is an unparalleled venue for global studies of humans and the sea, adaptations that provided societal benefits comparable to domestication, and from a hemispheric perspective, for exploring the foundations of human pathways into Australia, Oceania, and the Americas.

The search for Eskimo origins—the "holy grail" of Arctic archaeology—still remains hostage to the submerged coasts of Northeast Asia, where coastal sites in the Bering Sea earlier than 2 ka BP are rare. Russian scholars have long regarded the Lower Amur and Okhotsk coast as the likely centre for development of sea mammal hunting technology. River estuaries—calm in summer and ice-covered in winter—are ideal settings for people to experiment with harpoons, nets, and traps for catching large fish and sea mammals without the hazard of open-sea voyaging. It is no wonder that settled villages and ceramics appeared in the lower Amur more than 12 ka ago, and similar developments were taking place in Honshu. The authors in this book have found other ways to "work-around" the marine site void by demonstrating a Neolithic Marine Adaptation complex including settled villages, boats, ceramics, and harpoon technology.

A caution is needed about the danger of parochialism, even on a scale as large as Northeast Asia. Innovations spread as easily as DNA, and the maritime history of Southeast Asia and its huge archipelagos and seascapes may have produced seafaring, hunting, and other technologies that found their way north to the cold-water seas. Open intellectual horizons will be needed, as well as the inclusion of Indigenous perspectives and ocean, ecology, and paleoenvironment studies so well demonstrated in the following papers.

Future archaeologists will not be limited to the declining inventory of land-based archaeology. In the decades ahead, underwater research will begin to reveal the hidden assets of the sea floor. In the meantime, we need to keep in mind that most ocean food resources are readily available close to home. People did not have to travel far from land for subsistence purposes. Small canoes would have sufficed and probably were present during much of the Upper Paleolithic. True voyaging must have begun for other reasons—to escape danger, to colonize new lands, or to quarry or trade for needed resources, find spouses, or simply for the excitement of discovery and the prestige upon returning home with exotic goods, information, and tall tales. Challenge and fulfilling dreams are a driving force in human nature, and mastering the sea has been just as much an enduring quest as exploring *terra firma* (see Pitulko et al. 2019). In similar fashion, searching for the secrets of maritime history has motivated the authors of this volume to conduct their own explorations and broadcast their finds. Readers be forewarned: much of what is reported here, like voyaging to Kozu Island for obsidian 38 ka ago, might seem like tall tales. It is not. Imagine returning home with a load of obsidian and stories of bravado to spread via trade networks far and wide, and then, tens of thousands of years later, some piece of that obsidian finds its way to an X-ray diffraction machine. Now there is a story! And, there are many more in this book, as well as lots of deLaguna's courageous "informed speculation".

Recalling the void on the 1714 Guillaume Deslisle map, we may invoke the words of the famous Danish Arctic explorer, folklorist, and anthropologist, Knud Rasmussen, whose Fifth Thule Expedition of 1921–1924 centennial we are now celebrating (Krupnik et al. 2021). Ten years after sledging across Arctic America in 1924 searching for an Eskimo "homeland", and only six months before his death, Rasmussen had an address read at the 1933 Pacific Science Congress in which he called for international research to resolve the Eskimo question. "I am quite aware that a task like this cannot be brought to realization in the twinkling of an eye…It is however my firm conviction that one day there will be a great cooperative undertaking of this kind, and that this plan will be carried out" (Rasmussen 1934). Perhaps that time is now.

William W. Fitzhugh
Director, Department of Anthropology
Arctic Studies Center, Smithsonian Institution
Washington DC, USA
Fitzhugh@si.edu

References

Arutiunov, S.A., & Sergeev, D.A. (1969). Drevnie kul'tury aziatskikh eskimosov (Uzlenskii mogil'nyk) (Ancient Cultures of the Asiatic Eskimos: the Uelen Cemetery), Nauka, Moscow [English translation by Richard L. Bland, Shared Beringian Heritage Project, U.S. National Park Service, 2006].

Arutiunov, S.A., & Sergeev, D.A. (1975). Problemy etnicheskoi istorii Beringomoria – Ekvenskii mogilnik (Problems of the Ethnic History of the Bering Sea: the Ekven Cemetery), Nauka, Moscow [English translation by Richard L. Bland, Shared Beringian Heritage Project, U.S. National Park Service, 2006]

Bailey, G., & Parkington, J. (Eds.) (1988). *The Archaeology of prehistoric coastlines. New directions in archaeology.* Cambridge University Press. ISBN 978-0-521-25036-8.

Braje, T. J., & Rick T. C. (Eds.). (2011). *Human impacts on seals, sea lions, and sea otters: Integrating archaeology and ecology in the Northeast Pacific.* Berkeley: University of California Press.

Campbell, J. M. (1976). The Soviet–American Siberian expedition. *Arctic*, *29*, 2–6.

Chaussonnet, V. (1995). *Crossroads Alaska/Siberia* (Alaska exhibit catalog). Arctic Studies Center, National Museum of Natural History, Smithsonian Institution, Washington DC.

Chaussonnet, V., & Krupnik, I. (1996). *Perekrectki Kontinentov; Kul'turii Korfenniikh Narodov Dal'nego Voctoka i Alyaski (Crossroads of Continents: Native Cultures of the Far East and Alaska*). Smithsonian Arctic Studies Center and Russian Ministry of Culture. Washington and Moscow.

Chard, C. S. (1974). *Northeast Asia in prehistory*. Madison: University of Wisconsin Press.

Collins, H. B. (1937). The Archaeology of St. Lawrence Island. *Smithsonian Miscellaneous Collections*, *96*(1). Washington DC: Smithsonian Institution.

——. (1940). Outline of Eskimo prehistory. *Smithsonian Miscellaneous Collections*, *100*, 533–592. Smithsonian Institution, Washington DC.

——. (1971). Composite masks: Chinese and Eskimo. *Anthropologica* n.s., *13*(1–2), 271–278.

deLaguna, F. (1946). The Sadiron Lamp of Kamchatka as a Clue to the Chronology of the Aleut. *American Antiquity*, *11*(3), 202–203.

——. (1949). Review: *Archéologie du Pacifique-Nord*, by André Leroi-Gourhan, 1946. *American Anthropologist*, *51*(4), 645–647.

deLaguna, F. (1946). The Sadiron Lamp of Kamchatka as a clue to the chronology of the Aleut. *American Antiquity*, *11*(3), 202–203.

Derevyanko Anatoly, P., & Medvedev, V. E. (2006). Neolithic of the Nizhnee Priamurye (Lower Amur River Basin). In S. Nelson, A. Derevyanko, Y. Kuzmin & R. Bland (Eds.). *Archaeology of the Russia Far East: Essays in stone age prehistory*. *British Archaeological Reports IS* (vol. 1540, pp. 123–149). Oxford: Archaeopress.

Dumond, D. E. (2003). The so-called "Eskimo Wedge": A century after Jesup. In L. Kendall & I. Krupnik (Eds.). *Constructing cultures then and now: Celebrating Franz Boas and the Jesup North Pacific expedition* (pp. 33–48). *Contributions to Circumpolar Anthropology* 4. Washington D.C.: Arctic Studies Center, Smithsonian Institution.

Erlandson, J. M., & Fitzpatrick, S. M. (2006). Oceans, islands, and coasts: Current perspectives on the role of the sea in human prehistory. *Journal of Island & Coastal Archaeology*, *1*(1), 5–32.

Fitzhugh, W. W. (Ed.). (1975). *Prehistoric maritime adaptations of the circumpolar zone*. International Congress of Anthropological and Ethnological Sciences, Symposium volume. The Hague: Mouton.

Fitzhugh, W. W. (1988). Comparative Art of the North Pacific Rim. In W. Fitzhugh, & A. L. Crowell (Eds.). *Crossroads of continents: Cultures of Siberia and Alaska* (pp. 294–312). Washington: Smithsonian Institution Press.

——. (1998). Searching for the g: Virtual archeology in yamal and circumpolar theory. *Publications of the National Museum, Ethnographic Series*, *18*, 99–118. Copenhagen: Danish National Museum.

——. (2009). Stone shamans and flying deer of Northern Mongolia: Deer goddess of Siberia or Chimera of the Steppe? *Arctic Anthropology*, *46*(1–2), 72–88.

Fitzhugh, W. W., & Crowell, A. L. (Eds.). (1988). *Crossroads of continents: Cultures of Siberia and Alaska.* Washington: Smithsonian Institution Press.

Fitzhugh, W. W., & Chaussonnet, V. (Eds.). (1994). *Anthropology of the North Pacific rim.* Washington: Smithsonian Institution Press.

Fitzhugh, B., Gjesfjeld, E., Brown, W., Hudson, M. J., Shaw, J. D. (2016). Resilience and the Population History of the Kuril Islands, Northwest Pacific: A Study in Complex Human Ecodynamics. *Quaternary International*, *17*(419), 165–193. https://doi.org/10.1016/j.quaint.2016.02.003.

Habu, J. (2004). *Ancient Jomon of Japan*. Cambridge, England: Cambridge University Press.

Ikawa-Smith, F. (2009). Living on the edge of the continent: The Japanese archipelago 30,000–8,000 cal. B.C. maritime adaptation and seaside settlement in Northeastern Asia during the Pleistocene-Holocene Boundary. *North Pacific Prehistory*, *3*, 49–69.

Jochelson, W. (1925). *Archaeological investigations in the Aleutians Islands.* Washington: Carnegie Institution of Washington Publication 367. Washington DC.

——. (1928). *Archaeological investigations in Kamchatka.* Carnegie Institution of Washington Publication 388, VIII, 88.

——. (1933). *History, ethnology, and anthropology of the Aleut*. Washington D.C. Carnegie Institution of Washington.

Kendall, L., & Krupnik, I. (Eds.). (2003). *Constructing cultures then and now: Celebrating Franz Boas and the Jesup North Pacific expedition. Contributions to Circumpolar Anthropology* 4. Washington, D.C.: Arctic Studies Center, Smithsonian Institution.

Krupnik, I. (Ed.). (2018). *Early Inuit Studies: Themes and Transitions, 1850s–1980s*. Washington, D.C.: Smithsonian Institution Scholarly Press.

Krupnik, I., Crowell, A. L., & Pratt, K. (Eds.). (2021). Papers for: Across Arctic America: The Fifth Thule Expedition (1921–1924) Centennial. *Alaska Journal of Anthropology*, *19*(1–2).

Krupnik, I., & Fitzhugh, W. W. (2001). *Gateways: Exploring the legacy of the Jesup North Pacific expedition 1897–1902. Contributions to Circumpolar Anthropology 1*. Washington DC: Arctic Studies Center, Smithsonian Institution.

Langley, M. C., O'Connor, S., & Piotto, E. (2016). 42,000-year-old worked and pigment-stained Nautilus shell from Jerimalai (Timor-Leste): Evidence for an early coastal adaptation in ISEA. *Journal of Human Evolution*, *97*, 1–16. https://doi.org/10.1016/j.jhevol.2016.04.005

Larsen, H., & Rainey, F. (1947). Ipiutak and the Arctic whale hunting culture. Anthropological Papers of the American Museum of Natural History 42. New York.

Laughlin, W. S. (2002). To the Aleutians and beyond: The anthropology of William S. Laughlin, B. Frohlich, A. B. Harper, & R. Gilberg (Eds.). Department of Ethnography, National Museum of Denmark, Copenhagen.

Leroi-Gourhan, A. (1946). Archéologie du Pacific-Nord. Travaux et Mémoires del'Institut d'Ethnologie 42. Paris: Institut Ethnologie.

Luukkanen, H., & Fitzhugh, W. W. (2020). Bark canoes and skin boats of Northern Eurasia. Washington DC: Smithsonian Books.

McCartney, A. P. (1975). Maritime adaptations in cold archipelagoes: An analysis of environment and culture in the Aleutian and other island chains. In W. W. Fitzhugh (Ed.), *Prehistoric maritime adaptations of the circumpolar zone*. Mouton.

Pitul'ko, V. V. (1993). An early Holocene site in the Siberian high arctic. *Arctic Anthropology*, *30*(1), 13–21.

Pitulko, V. V., Kuzman, Y. P., Glascock, M. D., Pavlova, E. Y., & Grebennikov, A. V. (2019). "They came from the ends of the earth": Long distance exchange of Obsidian in the high arctic during the early Holocene. *Antiquity*, *93*(367), 28–42. https://doi.org/10.15184/aqy.2019.2

Reeder-Myers, L., Turck, J. A., & Rick, T. (Eds.). (2019). *Archaeology of human-environmental dynamics on the North American Atlantic coast.* University Press of Florida .

Rick, T., & Erlandson, J. (Eds.). (2008). *Human impacts on ancient marine ecosystems a global perspective.* University of California Press.

Rasmusen, K. (1934). Eskimos and Stone Age peoples. *Proceedings of the Fifth Pacific Science Congress, Vancouver, Canada*, 1933 (vol. 4: 2767–2772). Toronto: University of Toronto Press.

Sandweiss, D. H., McInnis, H., Burger, R. L., Cano, A., Ojeda, B., Paredes, R., Sandweiss, M. C., & Glascock, M. D.. (1998). Quebrada Jaguay: Early South American maritime adaptations. *Science*, *281*, 1830–1832.

Sanger, D. (1988). Maritime adaptations in the Gulf of Maine. *Archaeology of Eastern North America, 16*, 81–99.

Schuster, C. (1951). The survival of the eurasiatic animal style in modern Alaskan Eskimo a. In S. Tax (Ed.) *Selected Papers of the 29th Congress of Americanists* (pp. 45–55). Chicago: University of Chicago Press.

——, & Carpenter, E. (1996). *Patterns that connect: Symbolism in ancient and tribal art*. New York: Harry N. Abrams.

Serizawa, C., & Hurley, W. M. (Eds.). (1978). *Japanese prehistory*. Edited volume of *Asian Perspectives*, *19*(1). University Press of Hawaii.

Stanford, D. J., & Bradley, B. (2012). *Across Atlantic ice: The origin of America's Clovis culture.* Berkeley: University of California Press.

Stark, B. L., & Voorhies, B. (1978). *Prehistoric coastal adaptations: The economy and ecology of maritime Middle America.* Academic Press, New York.

Yellen, J. E., Brooks, A. S., Cornelissen, E., Mehlman, M. J. & Stewart, K. (1995). A Middle Stone Age worked bone industry from Katanda, Upper Semliki Valley, Zaire. *Science*, *268*(5210), 553–556. Bibcode: 1995Sci...268.553Y. https://doi.org/10.1126/science.7725100

Yesner, D. R.(1980). Maritime hunter-gatherers: Ecology and prehistory. *Current Anthropology*, *21*, 727–735.

The original version of the book was revised: Book subtitle inserted in front matter and covers and in chapter 2, section headings are corrected and chapter 14 the co-authors names “Viktor M. Dyakonov and Elena N. Solovyova” are corrected and Dyakonov’s acknowledgement inserted. The correction to the book is available at https://doi.org/10.1007/978-981-19-1118-7_17

Contents

Introduction

The Peopling of Northeast Asia's Maritime Region and Implications of Early Watercraft Transport

Jim Cassidy

Abstract The migration of people from Northeast Asia into the New World during the late Pleistocene has been generally accepted for almost one hundred years. This was thought to have taken place among terrestrial hunters of Pleistocene fauna. In recent decades a coastal migration hypothesis pertaining to the use of seaworthy watercraft has garnered increasing interest. Based on recent discoveries in North American archaeology and paleo-genetics this peopling process appears to have taken place approximately 17,000 years ago. However, the ecological, social and technological contexts requisite for such maritime based migrations have received comparatively little attention. Evidence of the use of late Pleistocene watercraft to occupy Australia, the Ryukyu Islands, the Paleo-Honshu Island and Hokkaido in Japan have been cited as a foundation for the hypothesized use of seafaring to traverse the coastal North Pacific from Northeast Asia to the Americas. To understand this process, it is necessary to elucidate theoretical and methodological parameters that accompany assumptions associated with the ecological conditions, social contexts for maritime subsistence practices and technological innovations for the development and navigation of seaworthy watercraft during this period. To evaluate the value of maritime based migration hypotheses it is essential to understand maritime related practices and the uses of watercraft in Northeast Asia during the late Pleistocene and Holocene before we can reasonably assert maritime based population movements across the North Pacific.

Keywords Northeast Asia · Migration · Terrestrial · Maritime · Watercraft · Seafaring · Technological innovation · Ecology

J. Cassidy (✉)
Chair of Maritime History and Archaeology, Maritime Museum of San Diego (Associate), 1492 N. Harbor Dr, San Diego, CA 92101, USA
e-mail: jimdcass@aol.com

J. Cassidy et al. (eds.), *Maritime Prehistory of Northeast Asia*,
The Archaeology of Asia-Pacific Navigation
https://doi.org/10.1007/978-981-19-1118-7_1

1 Introduction

The prehistory of aquatically focused societies in Northeast Asia are poorly represented in global syntheses. In an influential book on the origins and development of seafaring it was noted "the origins of east Asian seafaring, with its distinctive technologies indicative, perhaps, of an independent trajectory of development, is taken up only for Japan" (Anderson et al., 2010: xiv). Among many other reasons, the capabilities of East Asian mariners during the late Pleistocene are significant given the proposed importance of seafaring in the dispersal of people from Northeast Asia to the Americas during the late Pleistocene (Erlandson & Braje, 2011).

Many recent syntheses pertaining to migrations into the New World do not significantly address pertinent data from Northeast Asia. However, a summary of the Coastal Migration Theory has recently been offered, which hypothesizes that Paleo-Sakhalin-Hokkaido-Kuril (PSHK) populations may have comprised the progenitors of ancient Native American populations.

Between ~ 40–30 ka these foragers adopted mixed and variable terrestrial, near shore, and maritime subsistence adaptations along this northwestern Pacific coastal margin, with the degree of specialization differing from area to area… By about 20 Ka, sea levels as much as 130 m lower than modern, and correspondingly shorter travel distances between islands and refugia, allowed ocean-going coastal foragers in the PSHK to begin to expand along the Kamchatka peninsula to the southern margin of the Bering Land Bridge and Aleutian Islands, to the coastlines of southern Alaska and British Columbia (Davis & Madson, 2020:3).

Hypotheses such as these suggest that the coastal Bering-Land-Bridge (BLB) possessed sufficient biodiversity to support human habitation. However, a dearth of data available for Northeast Asia is in distinct contrast to the number of publications regularly updating the archaeology of coastal North America (Braje et al., 2017, 2020; Dixon, 1999; Erlandson, 2001, 2002, 2010; Erlandson et al., 2007a, 2007b, 2011, 2015; Fladmark, 1979, 1986; Gill et al., 2019; McLaren et al., 2019; Rick et al., 2013; Potter et al., 2018; Pratt et al., 2019; Sutton, 2017, 2018).

If we are to assess proposals pertaining to seafaring around the North Pacific, then comprehensive data must be made available from Northeast Asia. An effort to address this deficiency was made through the publication of the Journal of North Pacific Prehistory Volume 1 (2007), Volume 2 (2008) and Volume 3 (2009) edited by Jim Cassidy, Robert Ackerman and Irina Ponkratova. Unfortunately, this journal did not receive wide dissemination and no further volumes have been forthcoming. It is the intent of the collection of papers herein to provide an update to those previous journal issues through contributions by leading Korean, Japanese, Russian, German, Dutch, British, Canadian and American scholars of Northeast Asian prehistory. It is hoped that this data may become more widely available to specialists in maritime prehistory, Northeast Asian archaeology and the peopling of the Americas.

The following chapters will address evidence of aquatic activities during the late Pleistocene and Holocene in the East Korean/Japanese Sea (K/J Sea), Sea of Okhotsk and adjacent coastal areas of Korea, Japan, the Ryukyu Arc, Sakhalin Island, Kuril

Islands and the Russian Far East. It is hoped this will fill a void in the archaeological literature and permit more informed evaluations of North Pacific seafaring proposals and questions pertaining to intra- and inter-regional relationships through the origins and innovations of maritime technology throughout the hemisphere.

2 Theoretical Context

The term Northeast Asia has historically developed within a geographic and political context (Narangoa, 2014) and generally is understood to encompass the areas of the Mongolian Plateau, the Northeast China Plain, the Korean Peninsula, the Russian Far East, the islands of Japan, the Ryukyus, Sakhalin and Kuril. For the purposes of this volume, the maritime region of Northeast Asia has been extended to include the southern coastal regions of the East China Sea, K/J Sea, Sea of Okhotsk, Northwest Pacific Ocean, Chukchi Sea and Bering Sea.

Between 40–30 ka (thousand years) ago (all dates are calibrated, unless designated as ^{14}C), when the Ryukyu and Japanese islands were first inhabited by seafaring *Homo sapiens*, the climate was experiencing a gradual cooling that lowered sea levels from 60 to 80 m below present day, respectively (Benjamin et al., 2017). This drop in sea levels gradually drained the coastal areas of southeastern China and western Korea, shrinking the Yellow Sea into an elongated, relatively narrow and shallow protected bay (Fig. 1). This gradual process created a patchwork of new landforms, including evolving mud flats, lagoons, estuaries, near-shore islands and protected bays. Such conditions would have been ideal for the exploitation of aquatic resources and experimentation in the development of marine technology.

During the last-glacial-maximum (LGM), 24–18 ka ago sea levels had ultimately dropped to as much as 130 m below present, which completely drained the Yellow Sea and exposed the Chinese continental shelf (Ikawa-Smith 2009; see Fig. 1 in Chapter Over the Water, into and Out of the Japanese Archipelago, During the Pleistocene: Humans, Obsidian, and Lithic Techniques herein). This created an undulating land mass that was divided by the extended Yellow River between the present-day southeast China coast and the western Korean Peninsula. An entrenched drainage system formed by the Yellow River was established that ran in a north to south direction from the present Bohai Bay along the western side of Korea. This vast region has subsequently been inundated during the Holocene warming but would undoubtedly have played a significant role in the development of regional maritime activities and the dispersal of early East Asian populations to the Ryukyu Islands and Japan. During this process it is generally thought that the island of Taiwan was connected to the mainland but ultimately became increasingly separated by a widening body of water during the ensuing sea level rise associated with the post-glacial period.

Over the preceding 40 years, there has been numerous publications discussing the use of seaworthy watercraft to enter the New World during the late Pleistocene (Braje et al., 2017, 2020; Davis & Madsen, 2020; McLaren et al. 2020; Sutton, 2018). It has been proposed that seafarers employed boats to traverse the North

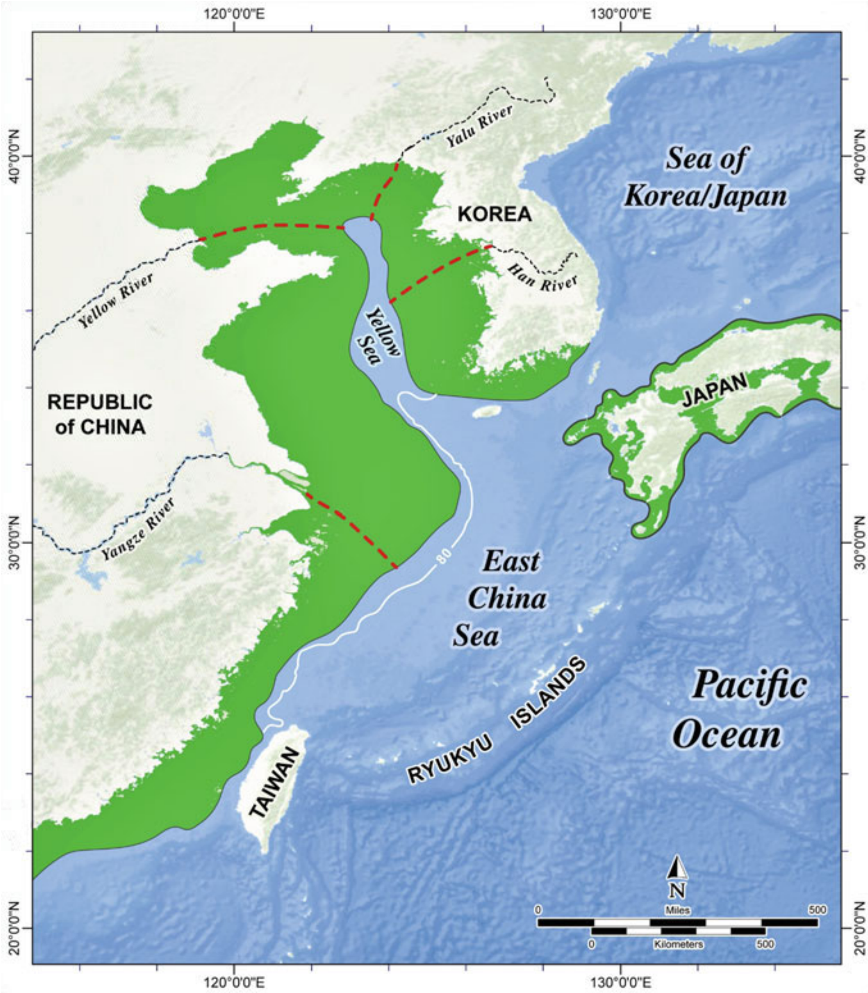

Fig. 1 Map of the southern maritime region of Northeast Asia reflecting sea levels between 60-75 meters below present during the time period of 40-30 Ka ago when the Ryukyu and Japanese islands were originally inhabited by seafaring modern humans.

Pacific coast from Northeast Asia while subsisting on a ubiquitous kelp highway and associated marine resources (Erlandson & Braje, 2011; Erlandson et al., 2007, 2015). These resources are assumed to included varieties of kelp, sea weeds, nearshore fish, shellfish, sea mammals, and migratory waterfowl. The term seaworthy watercraft used herein assumes hulls constructed to displace the water and protect the occupants from exposure, rather than simple rafts.

It has further been proposed that boats were employed to access nearshore islands, to ford rivers, and to circumvent headwater glaciers and rocky headlands of western

North America (Dixon, 1999; Fladmark, 1986). However, the necessity of seaworthy watercraft for use by the first peoples in the Americas has been questioned by Mark Sutton, who suggests that "any physical impediments, such as tidewater glaciers or major waterways, could have been circumvented using simple watercraft, such as rafts." (2018: 326).

The likelihood of a Pacific Coast Route (PCR) of entry has been supported by the discovery of numerous sites that pre-date the opening of a North American ice-free-corridor between the Laurentide and Cordilleran ice sheets sometime after 14 ka (Potter et al., 2018). Archaeological finds at Paisley Caves in Oregon (Jenkins et al., 2014), the Gault/Friedkin sites in Texas (Waters et al., 2018), Meadowcroft Rock shelter in Illinois (Adovasio et al., 1990), Page-Ladson in Florida (Halligan et al. 2016), Cooper's Ferry in Idaho (Davis et al., 2019), Huaca Prieta in Peru (Dillehay et al., 2012) and Monte Verde in Chile (Dillehay, 1984, 2000) all date between 16 and 14 ka ago (Fig. 3). The sites dating to this period are spread throughout continental North America and as far south as Chile (Fig. 2). This suggests the first people likely traversed along the coast, perhaps as early as 17 ka ago, and then moved inland, most likely along major river corridors, like the Columbia River (Sutton, 2018).

This presumes that ancient mariners were positioned in Northeast Asia by the late Pleistocene to make such a migration. To understand the peopling process of Northeast Asia we must recognize that populations may have come to occupy the region from both a northern interior route and a southern coastal route.

3 Ecological Perspective

If it is argued that early migrants into the New World travelled by seaworthy boats across the BLB, rather than by foot, then substantial environmental and behavioral imperatives would engender requisite technological innovations that must be addressed. Highly mobile terrestrial hunter-gatherers generally employed toolkits that were relatively simple and portable, such as microblades. When the increase in resource capture was necessitated then the use of human labor was generally intensified. Comparatively, aquatically based hunter-gatherer-fishers are universally recognized as innovators of complex toolkits that enhance the capture of resources through increased mobility over greater distances, at higher rates of speed that transport larger and heavier cargos. It must be recognized that the construction of watertight seafaring watercraft ranks among the most complex technological innovations in prehistory. This often results in the social reorganization of multi-family units within relatively sedentary base camps, as central based logistical foragers (Ames, 2002; Binford, 1980). Rather than consuming prey at kill sites, aquatic hunters generally transport their prey back to base camps for processing (Ames, 2002). Within a broader cultural context, among multiple competing goals and objectives, technological innovations require an investment of time, energy and materials to construct and can only be justified by enhanced capture rates of resources over the use-life of the innovation

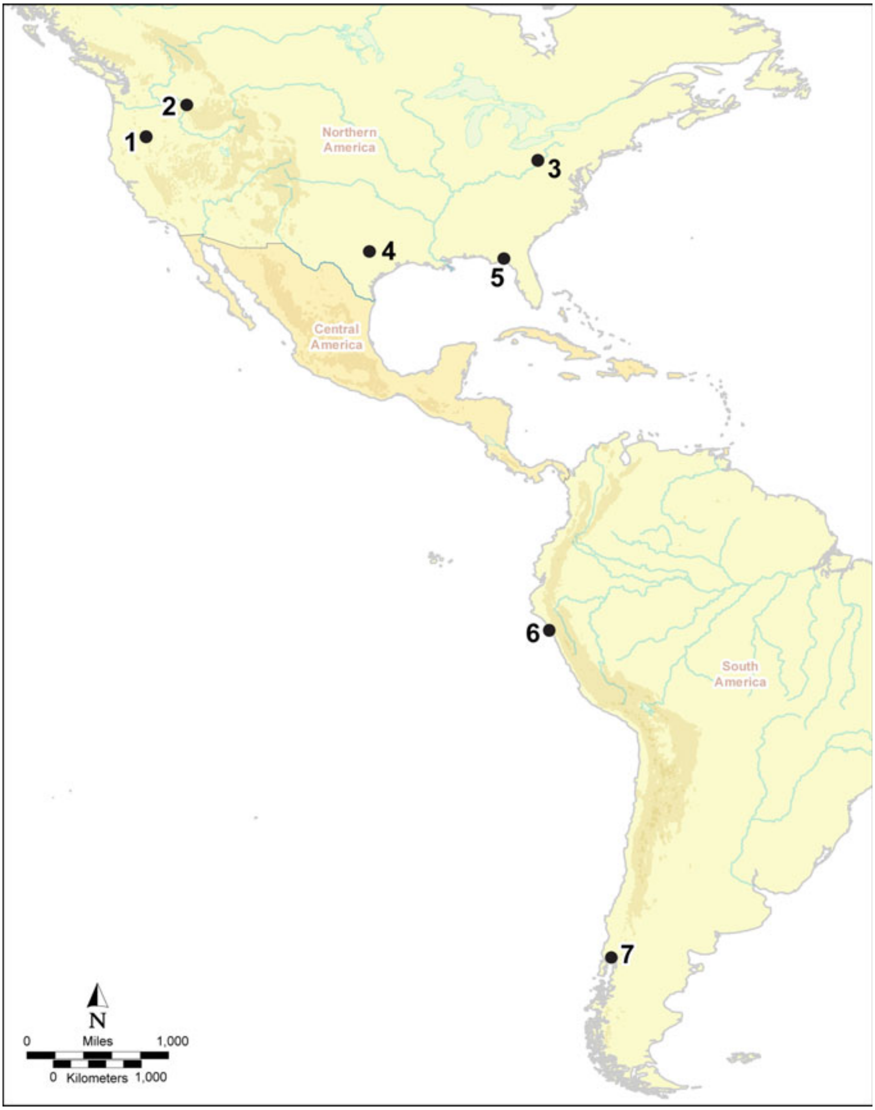

Fig. 2 Location of sites in North and South America mentioned in the text that date between 16.5–14 ka, including 1. Paisley Five Mile Caves, Oregon, 2. Cooper's Ferry, Idaho, 3. Meadowcroft Rockshelter, Pennsylvania, 4. Gault/Friedkin, Texas 5. Page-Ladson, Florida 6. Huaca Prieta, Peru and 7. Monte Verde, Chile

(Ugan et al., 2003). From a behavioral perspective the innovation of new technologies should occur repetitively over time in an incremental manner to minimize costs and risks of failure to capture prey.

A critical barrier to the use of watercraft is the significant difference between the warm waters of the sub-tropics and the frigid waters of the sub-arctic, presently divided at 40º north latitude (McGrail, 2010). An early linkage of effective solar temperatures, biotic productivity and human settlement patterns was proposed by Lewis Binford (1980). This was followed by Robin Torrence's (1983) argument that the structure of hunter-gatherer toolkits is conditioned by the potential risk of resource failure.

In higher latitude environments, where effective solar temperatures are lower, the risks of resource failure are greater and result in more conservative constraints in technological innovations. Conversely, in lower latitude environments experiencing higher effective temperatures the risks of resource failure may be eased, thereby reducing time-stress and allowing greater opportunities for toolkit elaborations (Broughton & O'Connell, 1999).

3.1 Technological Innovations

The contrast between subsistence economies specializing in terrestrial hunting *versus* aquatic resource collecting is dramatic (Ames, 2002; McGrail, 2010). We must therefore ask what conditions would compel people to abandon subsistence practices on land and venture onto open waters with boats to pursue aquatic resources? It has frequently been argued that the early origins and use of watercraft may largely be unknowable because sea level rise has inundated archaeological sites located on paleo-coastlines. Such propositions are largely based on the concept that the absence of empirical data does not necessarily mean an absence of human activity. However, the framing of arguments in a more empirical context, where possible, holds the potential to shed light on ongoing inquiry. It is proposed here that the application of universal technological capabilities of watercraft pertaining to materials employed, buoyancy, hydrodynamic design and speeds should shed light on suppositions of prehistoric boat use and their presumed degree of seaworthiness (Ames, 2002; Cassidy, 2021; Cassidy et al., 2004, 2019; McGrail, 2010; Sutton, 2018).

The term seaworthy is often used as a descriptor of technological capabilities pertaining to levels of watercraft reliability and efficiency. Boat technology assumes a range of innovations, from the use of flotation devices, rafts, and watertight hulls (Cassidy, 2021; Cassidy et al., 2004; McGrail, 2010; Sutton, 2018). Each of these are characterized by specific parameters effecting construction and maintenance, levels of thermic exposure, time/energy costs, hydrodynamic characteristics, transport speed, cargo capacity and distances travelled. As part of an assessment of the technological capabilities of early watercraft Sean McGrail (2010) defined transport speeds to be 1–2 knots per hour (one knot equals 1.85 km per hour) for flotation devices and/or rafts and four knots per hour for watertight hulls. Also, based on ethnographic accounts, Kenneth Ames (2002) further verified speeds and maneuverability for watertight canoes to be approximately four knots per hour. Investing in the processes of technological innovation for watercraft construction and design must take into consideration the efficient acquisition of subsistence calories by maximizing energy gained and minimizing time expended (Smith & Winterhalder, 1992).

The production and maintenance of watertight watercraft represents a high cost of investment of specialized human labor, the acquisition of raw materials, and related investment of labor and time for processing. Once constructed, boats and associated equipment universally require continuous investment of materials and energy to maintain and operate throughout their use-life. An application of the technological characteristics and documented speeds associated with the different types of watercrafts yields the distances achievable over a single day of paddling. For instance, a voyage of 100 km at a maximum speed of 2 knots on a raft would take 27 h of continuous paddling. In contrast, the same distance in a hydrodynamically efficient watertight hull at a speed of 4 knots would take approximately 13.5 h. This distance and length of time appear to approximate the optimal operation of a seaworthy watercraft's use per day. Naturally, these estimates do not account for important external factors, such as winds, swells, currents or tidal flow.

Clearly, complex technological innovations required in the design of seaworthy watercraft would need to take place in an incremental fashion over time. This would most likely take place in a temperate environment containing rich biodiversity and safe access to both fresh water and aquatic resources. Such resources as shellfish, near-shore fish and pinnipeds that haul out on land would be attractive and relatively easy to capture. A desire to increase the capture rate of mobile aquatic prey, such as deep-water fish and sea mammals, may lead to the innovation of flotation devices and rafts. These devices would make it possible to access other optimal resource patches, such as nearby islands, and lead to further innovations in improved hydrodynamic, speed, crew and cargo capacity, and associated equipment. Such a scenario would most easily develop in a lower latitude environment, such as tropical or sub-tropical waters, where resource abundance results in reduced time stress and where the extended human exposure to aquatic environments is not hazardous. This scenario appears to be supported by the occupation of Australia over 50 ka ago (Broughton & O'Connell, 1999) and the subsequent gradual spread of maritime exploration/colonization northward into cooler waters over the ensuing 10–20 Ka period.

Proponents of the PCR model have emphasized a coastal route of migration with the use of seaworthy watercraft. They point out that boats were used to travel along the Ryukyu Islands, including Okinawa before 35 ka ago (Matsu'ura, 1996; Fujita et al., 2016) and the ancient Japanese Island of Paleo-Honshu as early as 38 ka (Ikeya, 2015) (Fig. 3). "This placed seafaring people in the cooler waters of Japan and the North Pacific during the LGM, suggesting that they were developing the boats and other technological capabilities to continue around the Pacific Rim to Beringia and beyond" (Braje et al., 2020: 4). This appears to suggest a level of cultural homogeneity across this vast geographic landscape that does not conform to the complexity expressed in both archaeological and genetic data (Gakuhari et al., 2020; Hudson, 2017; Shinoda & Adachi, 2017). This also does not sufficiently consider the motivations and challenges to pursue requisite technological innovations in the development of cold weather clothing, shelter and nautical gear necessary to navigate northern sub-arctic and arctic waters through and around pervasive ice flows.

Hypothermia is a life-threatening condition that occurs when the human body is no longer able to maintain a normal temperature and drops below 95º Fahrenheit. In the cold waters of the North Pacific hypothermia becomes a significant barrier and based on present knowledge does not appear to have been technologically mastered until the early to middle Holocene. "Unlike tropical and temperate locations, subarctic and arctic environments require unique technologies, skills, and strategies to travel, fish, and hunt over always frigid often frozen, and frequently storm-prone waters" (Fitzhugh, 2016: 2).

4 Northeast Asian Terrestrial Context During the Late Pleistocene

Lowered sea levels during the LGM reduced the sizes of both the K/J Sea and the Sea of Okhotsk (Sikora et al., 2019). This created enlarged coastal plains along the northern shores of both seas and formed a land-bridge from the continental Russian Far East, where the Amur River discharges into the Sea of Okhotsk (at 54º north latitude), and across both Sakhalin and Hokkaido (Kononenko & Cassidy, 2007). The late Pleistocene Island of Honshu remained separated from Hokkaido by a narrowed Tsugaru Strait (see Chapter Over the Water, into and Out of the Japanese Archipelago, During the Pleistocene: Humans, Obsidian, and Lithic Techniques, Fig. 1 herein). The ensuing climatic warming of the Holocene resulted in a rise of sea levels and the establishment of coastal margins and maritime regions we recognize today, including the separation of Sakhalin, Hokkaido, Honshu, Shikoku, Kyushu, Cheju, the Ryukyus and Taiwan islands.

The Amur River is the only major river in central Siberia that travels southward, and ultimately turn northward, before discharging into the Sea of Okhotsk. During the late Pleistocene this river provided a passable corridor across the frigid regions of southern Siberia to where the Sea of Okhotsk and K/J Sea converge at the modern Tartarsky Straight. Even during the warming period of the Holocene, the winters in Siberia, and both of these seas, were strongly affected by southerly monsoon winds and moisture in the form of rain and snow emanating from the Arctic (Cassidy, 2004).

> The Amur territory occupies a crucial geographic position as a crossroad connecting Siberia, the Russian Far East, Japan and Northern China. Ecologically, even during the peak of the Sartan Glaciation, the Amur River Basin was not affected by catastrophic climatic changes and may have served as a refuge for northern populations during the glacial maximum. Pollen data indicates that there were birch-larch open forests, marshes and meadows in the Amur-Zeya lowlands, with scattered dense coniferous forests and low-bush tundra in the

> mountainous areas. However, the emergence of extreme glacial conditions between 20,000–18,000 years B.P. may have stimulated an increase in the mobility patterns of hunter-gatherers and their physical migration in a southerly direction. (Kononenko & Cassidy, 2007: 25–26).

As along Beringia and North America, the exposed coastal plains of the K/J Sea and Sea of Okhotsk provided a relatively unhindered pathway for hunters of late Pleistocene fauna, such as mammoth, musk ox, horse and reindeer (Vasilevskii, 2005). However, many of the occupation sites left behind by these climate refugees are now submerged along the northern shores of the two seas. These migrants from Siberia, via the Russian Far East, would have arrived with essential knowledge of aquatic technology to ford obstacles such as meadows, swamps and rivers with the use of rudimentary forms of watercrafts. However, extended exposure to these arctic waters would have proved hazardous and required the use of insulated and boats and clothing.

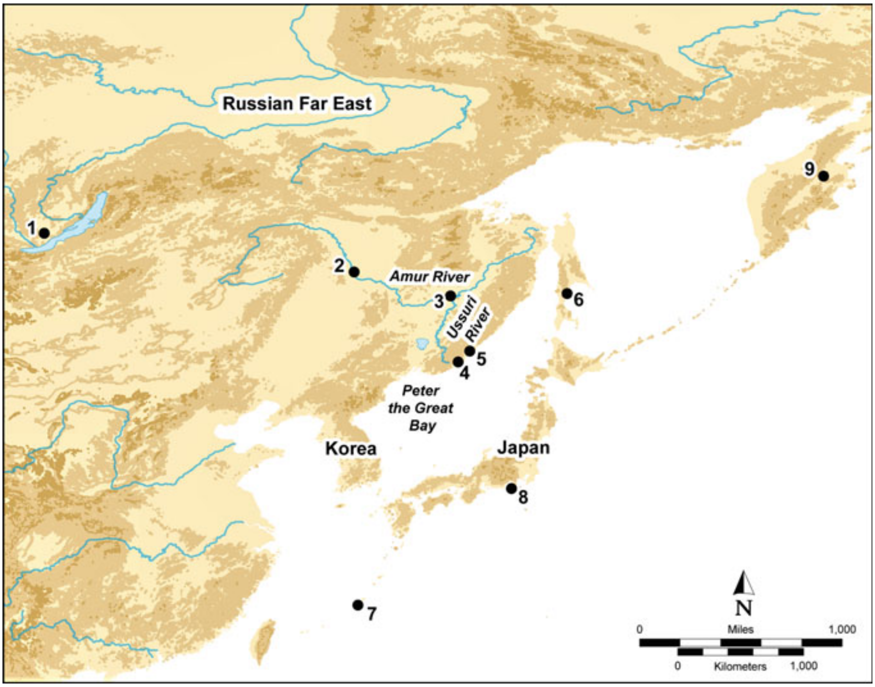

Fig. 3 Location of sites in Northeast Asia mentioned in the text including 1. Mal'ta, Trans-Baikal of central Siberia, 2. Gromatukha Culture, middle Amur River of east Siberia, 3. Goncharka-1, lower Amur River of the Russian Far East, 4. Geographic Society Cave, mouth of the Partisinskaya River, Primorye Region, 5. Ustinovka Complex, on the Zerkalnaya River, Primorye Region, 6. Oganki-5, on Sakhalin Island, 7. Sakitari Cave, on Okinawa Island, 8. Kozu Island, off Honshu Island and 9. Ushki, on the central Kamchatka Peninsula

The concept that the Americas were originally peopled by the diffusion of migrants crossing the BLB from Northeast Asia after the LGM is widely accepted, especially given the emergence of recent genomic data (Raghavan et al., 2014, 2015; Graf & Buvit, 2017; Moreno-Myer et al., 2018; Scheib et al., 2018; Wang, 2021). Presently, the earliest evidence of human occupation of the Russian Far East comes from Geographic Society Cave that yielded a date of 32,570 ± 1510 ^{14}C B.P. (before present) (Vasilievsky, 1996: 254–255) (Fig. 3). This site is located on the Partisanskaya River on the northern K/J Sea, in the Primorye region of the Russian Far East. The core and flake tools recovered from this site were in association with fauna of mammoth, elk, reindeer, Manchurian deer, roe deer, brown bear, horse and woolly rhinoceros. Pollen samples indicate an environment of coniferous broad-leafed forests.

This suggests a possible early East Asian genomic human occupation of the region approximately 8 ka (thousand years) prior to a proposed movement of people from the Mal'ta site in the Trans-Baikal area of central Siberia southeastward, along the Amur River refugia, just prior to the LGM (Fig. 3). This appears consistent with the model proposed by Graf and Buvit (2017) that suggests the genetic mixing of East Eurasian and early East Asian populations around 22–18 ka ago, which ultimately resulted in the genome identifiable among ancestral Native Americans.

> Native American individuals share more alleles with Boisman and the Mongolian Neolithic individuals than with most other East Asian populations, suggesting that an early branch of this lineage—reflecting the northern distribution of the Tianyuan-related branch… was the source for the East-Asian-related ancestry in Native American peoples (Wang, 2021: 415).

This is also consistent with recent genome sequencing that shows ancient coastal populations in Primorye, Sakhalin, Hokkaido and northern Honshu shared a common east Eurasian ancestry (Gakuhari et al., 2020).

Archaeological sites along the Amur River dating to the LGM have yet to be discovered. However, sites along the central Amur River, and the tributary Zeya River, have been defined as the Gromatukha Culture that dates between 15,010–9550 BP (Derevianko et al., 2017) (Fig. 3). These sites contain the earliest ceramic vessels found in southern Siberia. Also, occupation of the lower Amur River, above the present day city of Khabarovsk, has been identified at Goncharka-1 that dates to approximately 13 ka (Shevkomud & Yanshina, 2012) (Fig. 3). Survival along these major rivers would require a sophisticated knowledge of local aquatic resources and the use of, at least, rudimentary forms of watercraft (Fig. 4).

Occupation of the northern coastal area of the K/J Sea also appears to coincide with the occupation of Ustinovka-7, dating to 18.6 ka BP, located 34 km inland along the Zerkalnaya River, in the Primorye Region (Kononenko & Kajiwara, 2003). The Ustinovka complex of sites, located on a succession of river terraces, spans the late Pleistocene through the early Holocene and reflects repeated seasonal occupations that exploited a high-quality source of silicified stone tool material (Fig. 3) (Gomez Coutelouly, 2007). This sequence of sites documents a progression of stone tool technology spanning Upper Paleolithic Levellois macroblades (Fig. 3), microblades, both stemmed and leaf-shaped bifaces (Fig. 5), and flake-core stone tool technologies

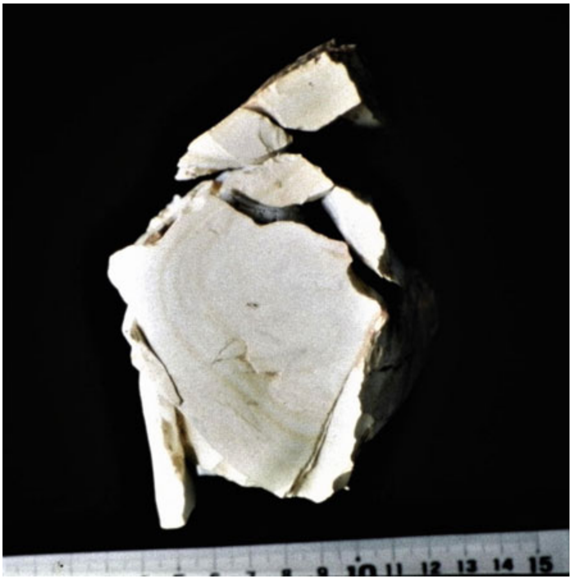

Fig. 4 An Upper Paleolithic Levallois core and refit blades recovered from the Ustinovka 7 site (basal layer OSL dated to 18,600 Ka ago) in the Primorye Region of the Russian Far East. (Photograph provided by Hiroshi Kajiwara)

that date from 20 to 9 ka BP. These sites appear to span the transition from broad spectrum terrestrial hunting to that of riverine and littoral capture of aquatic resources, such as waterfowl and salmon (Kononenko & Cassidy, 2009). This may be reflected in the chipped stone effigy of a fish recovered from the early Holocene site of Ustinovka-3 (see Fig. 4 in Chapter The Origins of Aquatic Lifestyles Along the Zerkalnaya and Rudnaya Rivers on the Northern Sea of Japan, Primorye Region, Russian Far East herein) (Kononenko, 2003).

Recent arguments have proposed that stemmed projectile points were introduced into the New World as part of the North Pacific maritime migration hypothesis (Braje et al., 2017). One concern is that most of the early sites with stemmed points, both in Northeast Asia and the Americas are not located near the coast but are associated with terrestrially oriented hunting deposits (Potter et al., 2018; Sutton, 2018). Pratt et al., (2018: 32) have pointed out that "Stemmed projectile and socketed-hafting technology characterizes the Upper Paleolithic record of greater Northeast Asia, starting well before the LGM. Bifacial technology eventually became incorporated into this tradition, early in the late glacial of eastern Siberia, the Russian Far East, and possibly Japan."

Radiocarbon data obtained from the Ogonki-5 site on the Sakhalin-land-Bridge supports an occupation between 19.5–17.8 ka ago (Vasilevskii et al., 2010) (Fig. 3). This site reflects a pattern of generalized hunting of terrestrial fauna. At present, no archaeological sites dating to the late Pleistocene have been discovered in the coastal regions of Northeast Asia farther east than Oganki-5 on the Paleo-SHK (Pratt et al., 2019; Vasilevskii et al., 2010).

> Conservatively, we can say by about 17–15,5 ka, the LUP spread as far as the middle Alden River in southwestern Beringia represented at the Diuktai Cave, Ust'Mil', and Verkhne